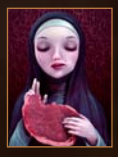
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3dcreative

Issue 065 January 2011



Interview
Chris Nichols



The Gallery
Carlos Ortega Elizalde
Tomasz Strzalkowski,
& more!



Project Overview
"Ship"
by Moises Gomes

Cover image by Jesse Sandifer

VOLCANIC MONSTER

Jesse Sandifer shows us how he created his magnificent lava creature using ZBrush.



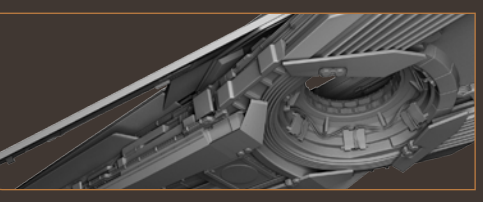
Photoshop Post Effects

Richard Tilbury kicks of our brand new series by showing us how to add fire and heat haze to our 3D image.



Unreal Games Engine Tutorial

Andrew Finch continues to blow us away with his Italian Courtyard tutorial series, this month concentrating on Static Textures.



Modeling A High-Poly Spaceship

In our **Creating the Celeritas** series we take a further step towards a finished image with Djordjie Jovanovic, Luigi Terza & Tamás Gyermán .



Editorial

Hello and welcome to the Hello and a very happy New Year! I am sure you are all feeling well fed and rested after the Christmas period. As I look out of my window now I can see the snow hammering down and it is cold outside! Although the temptation to grab the sledge and head out side is strong, I think I will sit in the warmth and take a look at the January issue of 3DCreative instead.

This month's magazine is packed out with treats and surprises, but the first on my list is our interview with Chris Nichols. Chris is a great 3D artist who has worked on blockbuster films including his current project Thor. You will recognise a lot of Chris's work including some of the scenes from the film Invictus which he worked on.

This month's making of is by **Moises Gomes**. You may remember his great image Ship from the gallery section ofthe magazine a few month's back. Well in this month's magazine Moises talks us through the entire process, from the concept phase through to modeling and even a little matte painting. This one should cater for any 3D fan!

ZBrush Monsters has been an amazing series! Looking at the great images that have been created so far makes me want to give ZBrush a go! This month we are in the capable hands of **Jesse Sandifer**. If you like me are feeling the cold and prefer it a little warmer you will love this article as Jesse shows us how he created his Volcanic Monster.

Many of you will be itching to read the next chapter in the Unreal Games engine tutorial. **Andrew Finch** who is currently working at Codemasters will be showing us how to create some accessories for our game level, and how you texture them using photo's. I hope you are all enjoying this series and I am looking forward to you all sending me your game levels so I can have a go!

This month we start a great new series which will be dealt with by 3DTotal's **Richard Tilbury**. Many of you will be used to using Photoshop to improve your 3D stills, but will perhaps also try to create effects in 3D that can be created more efficiently in Photoshop. This is where this great series comes in. Rich will be showing you how to complete your 3D image by adding effects in Photoshop. In this issue Rich will be looking at heat haze, fire and smoke.

Our Creating the Celeritas series has really taken off (sorry!) and in this issue our fantastic 3D pro's will be showing us how to turn their low poly spaceship into a high poly model. You will all be familiar with the artists involved, but for those who aren't in Cinema 4D we have **Tamas Gyerman**, in Maya we have **Luigi Terzi** and in 3ds Max we have **Djordje Jovanovic**.

I hope that you all enjoy the first issue of 2011. We have a great variety of tutorials and an amazing gallery including work from **Carlos Ortega**, **Peng Zhao**, **Bruno Melo** and many more! What else could you ask for?


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Modeler Texture Artist

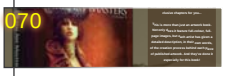

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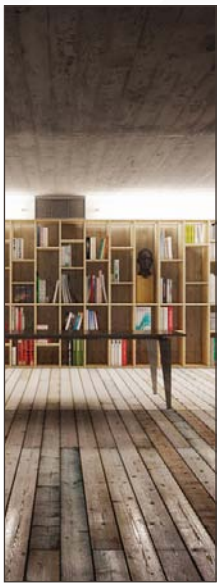
3DTotal.com Partnering With ConceptArt.org

3DTotal is glad to announce that the successful anti-piracy system used on ConceptArt.Org to protect it's video content is now being used to bring an end to piracy of the content produced by the incredible artists who support our magazines, website and tutorials which are enjoyed by so many. This anti-piracy effort has brought to light many of the users who have been pirating content illegally in the ConceptArt.org community and it is now assisting with protecting and enforcing copyrights here.

3DTotal greatly appreciates all our customers and the incredible artists who support this community with products. Piracy has become a major obstacle that must be resolved in order to see the artists who create these works and 3DTotal see success long into the future. Without the content sold here, this community and resource would not be what it is. With the support of our customers we have been able to offer an ever increasing stable of great content at affordable prices. Thank you all for your continued support. We are here to help teach and assist artists worldwide.

CONTRIBUTING ARTISTS

Every month artists from around the world contribute to 3DCreative, and you can find out a little more about them right here! If you'd like to get involved in 3DCreative magazine, please contact: simon@3dtotal.com



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As the son of a photographer Djordje became involved in visual arts from an early age. After finishing the High School for Design he graduated the University of Arts in Belgrade in the Computer Art and Design course. Currently he works as a freelance 3D artist specializing in a Hard Surface Environment modeling, texturing and Lighting.

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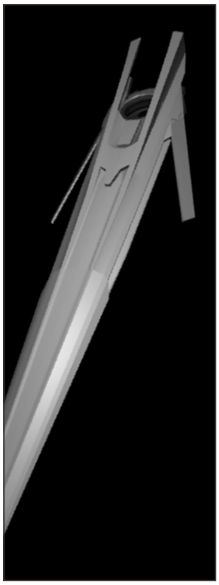
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Luigi Terzi works and lives in Torino (Italy). After a 10 year experience as illustrator and 3D artist in advertising he recently founded a company with other freelance artists called Blackbox .

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TAMÁS GYERMÁN



Tamás Gyermán is a fan of all space and fantasy art. Above all he likes to create spaceships and grand space-scenes. He always uses powerful colors and contrasting lights in his images.

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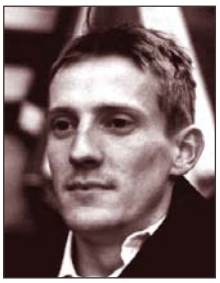
ANDREW FINCH

Aged 28 and living in the great city of Birmingham, in the U.K. He has a degree in 3D Animation which inspired his passion for environment art. He now works as an environment artist at Codemasters. He says, "Working in the games industry is exciting: you never know what the next project will be and there's always something new to learn. This helps to keep you creative and grow as an artist." afinchy@googlemail.com





RICHARD TILBURY



Has had a passion for drawing since being a couple of feet tall. He studied fine art and was eventually led into the realm of computers several years ago. His brushes have slowly been dissolving in white spirit since the late 90s and now, alas, his graphics tablet has become their successor. He still sketches regularly, balancing his time between 2D and 3D.

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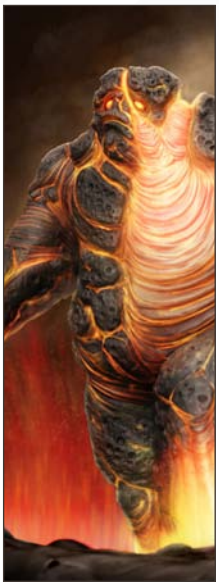
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Jesse Sandifer

Is a self-taught digital artist with 8 years experience. He co-owns Green Grass Studios in Dallas, Texas, which works on a variety of projects for films, games, television, commercials and in-game arena entertainment. Most of his spare time is spent participating in online challenges, doing personal artwork and dabbling with drawing and traditional sculpting.

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Moises Gomes



Moises Gomes has been working in computer graphics for at least three years in Brazil. He is always looking to improve his artistic foundations and techniques through the study of human anatomy, inorganic forms, character development and sculpture. His goal is to be a 3D artist like the great masters.

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Get the most out of your Magazine!

If you're having problems viewing the double-page spreads that we feature in this magazine, follow this handy little guide on how to set up your PDF reader!







Setting up your PDF reader

For optimum viewing of the magazine, it is recommended that you have the latest Acrobat Reader installed. You can download it for free, here: DOWNLOAD!

To view the many double-page spreads featured in 3DCreative magazine, you can set the reader to display 'two-up', which will show double-page spreads as one large landscape image:

1. Open the magazine in Reader;
2. Go to the View menu, then Page Display;
3. Select Two-Up Continuous making sure that Show Cover Page is also selected.

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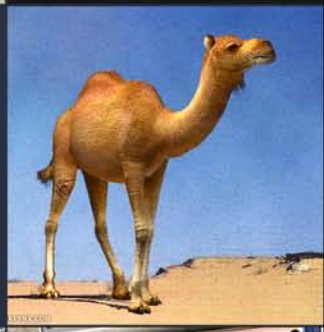






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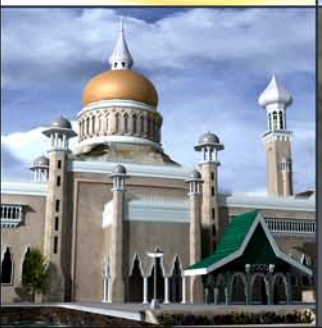












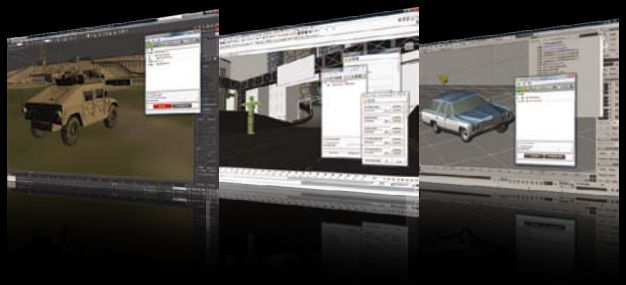


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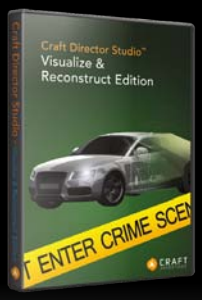
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"Character can get quite refined as they need to deliver a performance and be realistic at the same time"

Chris Nichols

After suffering through an undeveloped animation course at college, Chris Nichols took matters into his own hands and set up a two-man studio in his apartment to develop his modeling and texturing skills. Five years on and he's currently working as a modeler on the latest offering in the Marvel movie universe: the highly anticipated *Thor*.

Interview with Chris Nichols



You mention on your website that you began your career as a prop modeler, but how did you come to be involved in the CG industry and what prompted you down this path?

I started in 2007 as a prop modeler at Bardel Entertainment, but previous to this I lived in Australia and had prepared for a year before moving to Vancouver.

After high school I did three years of graphic design where I was introduced to digital art. We learned a lot about Photoshop and a bit of Cinema 4D and I knew I wanted to get into 3D. After graduation in 2004, I did a year of animation at the same college, except the course was really underdeveloped and we had to source outside help to come in and teach us.

> "It's a really satisfying experience to get an asset through and watch as each part of the pipeline takes it to completion in the shots."

We tried to make a faux episode of the *Animatrix* as a year-long project, which pretty much fell on its face half way through the year as most of the class had dropped out and the five of us that were left eventually shrank to myself and another guy by the end of the year.

He moved into my apartment and we set it up as a small studio, working day and night. This was where I really learned a lot about modeling and texturing, both from him and the film.

We never got the film finished, but had enough material to make into some sort of trailer so we flew over to Sydney and visited a bunch of studios to show off our work. We had a good response and got some helpful critiques, and even got to do some short term work at Digital Pictures. As it turned out we both got hired closer to home to work on a short film called *Ironbird* for close to a year before we decided to move to Vancouver to look for work.

I ended up at Bardel and my friend got hired at Blur down in Venice.

Your collaboration with your friend sounds like it was a real learning experience and a good introduction to working in a team, but what crucial lessons and skills did you learn at Bardel that have helped in your subsequent career?

Working in a structured studio was interesting in that I had been used to working in a loose



manner. It takes some getting used to, being productive from 9 – 5, meeting deadlines and communicating with other areas of production such as rigging and texturing.

It's a really satisfying experience to get an asset through and watch as each part of the pipeline takes it to completion in the shots.

I noticed you worked on the film *Invictus* as a texture artist. Can you describe your role in the project in a little more detail and tell us what types of texture work you undertook?

Initially I was hired at CIS to work as a texture artist on the film, which involved painting dozens of the stadium crowd digital doubles, rugby player digi-doubles and any props or set pieces. A lot of what I was doing was projecting face and body photos onto geometry the modelers had made and creating variations of clothing and accessories.

A few months before the film completed I got to work on some environments for the film such as the U.N assembly in New York, working with a matte painter to provide models and textures that were used for the scene.

It is interesting to hear about your role on *Invictus*, because it not a film that contains any obvious CG. How big an impact does the project make to your day-to-day job, or is modeling and texturing pretty much the same ultimately?

Well, on *Invictus* the background crowds were not supposed to be something the audience paid any attention to really; they just had to look and act normally and not pull focus from the action. However they also had to look real from any camera, and work in the crowd engine. Ultimately it was like a game pipeline, using normal maps for surface detail and mid res diffuse and spec maps for the surface.

The thing with this sort of project is that we need to get through loads of models quickly so only a small amount of time should be assigned to each character. I think it would take about a day to texture a full character from start to finish.



Can you tell us something about the worm creature in your gallery and the background behind it?

It was for a film test I worked on at Spin VFX back in 2008. It's a parasitic worm that crawls out of a toilet and attacks a woman. I think we named it Blinky. We had a clay design maquette provided and from that I modeled and sculpted the worm in Mudbox and worked with a Lookdev artist to create the slippery skin textures for the shots.



Which people do you feel have had the greatest influence over your development as an artist?

Bay Raitt was a big inspiration to me when I was getting interested in 3D. I was really impressed with the work he did on Gollum in *The Lord of the Rings* and had hoped to get into films and model creatures.

Before I moved to Vancouver I was really into the art of Marco Menco, Kolby Jukes, Pete Zoppi and Miguel Ortega and I've been aiming to reach their skill level ever since I started focusing on characters. I added people's work I really liked to my MSN or networked with them in other ways, and through that got critiques on my work from some of my favorite character artists. Since I've moved here I've worked, or become friends with, a lot of the talent I used to and still look up to, which has been a really rewarding experience.



What have been the most challenging projects you have worked on and why?

Each project has its own challenges and issues to deal with ,whether it's complexity or just plain deadlines. *Thor*, the film I'm working on now at Digital Domain, is definitely the hardest project I've worked on, just because the schedule is tight so we constantly have to find ways to get our assets looking as good as possible in a short amount of time.

I also have a hand in both the modeling and texturing of environments, creatures, props etc. It's an exciting time, but it can be gruelling.

What do you find the most interesting to work on between props, environments and characters, or does it really depend on the project ?

Characters! Usually you get more time to work on a character than a prop or environment and generally they are a lot more fun to do. Props or environments are usually done quite quickly and because of camera views, as long as it looks good in the shot there's no need to refine the details. Characters can get quite refined as they need to deliver a performance and be realistic at the same time. It's a lot of noodling back





and forth with rigging and Lookdev usually before it's finished, but I love the process and the final result is so satisfying.

Which films have made a lasting impression on you and what were the most significant aspects?

The Lord of the Rings. I was just so blown away by *The Fellowship of the Ring* and the subsequent sequels and that's really what motivated me to try get into the industry. I was mesmerized by the Balrog, Cave trolls, Gollum and the Nazgûl, and even today I watch the films at least twice a year. I don't really know why grotesque creatures attract me, but I really enjoy watching them on screen or making them. In recent times I love the *Harry Potter* films and I think *District 9* was amazing too, but I don't think anything will compare to that first experience of watching Fellowship.

If you were given the opportunity to translate a book into a film, what would it be and why?

I think I would love to see Frank Herberts *Dune* re-made into a film. I like David Lynch's version of the book, but think it could be done justice with a skilled director like Darren Aronofsky or even Alfonso Cuarón. There's so much great material on both an intellectual and entertainment level, and I think it would be incredible to see the sand worms of Aarakis bought to life by a good VFX studio. This would be a dream project.

CHRIS NICHOLS

For more work by this artist please visit:
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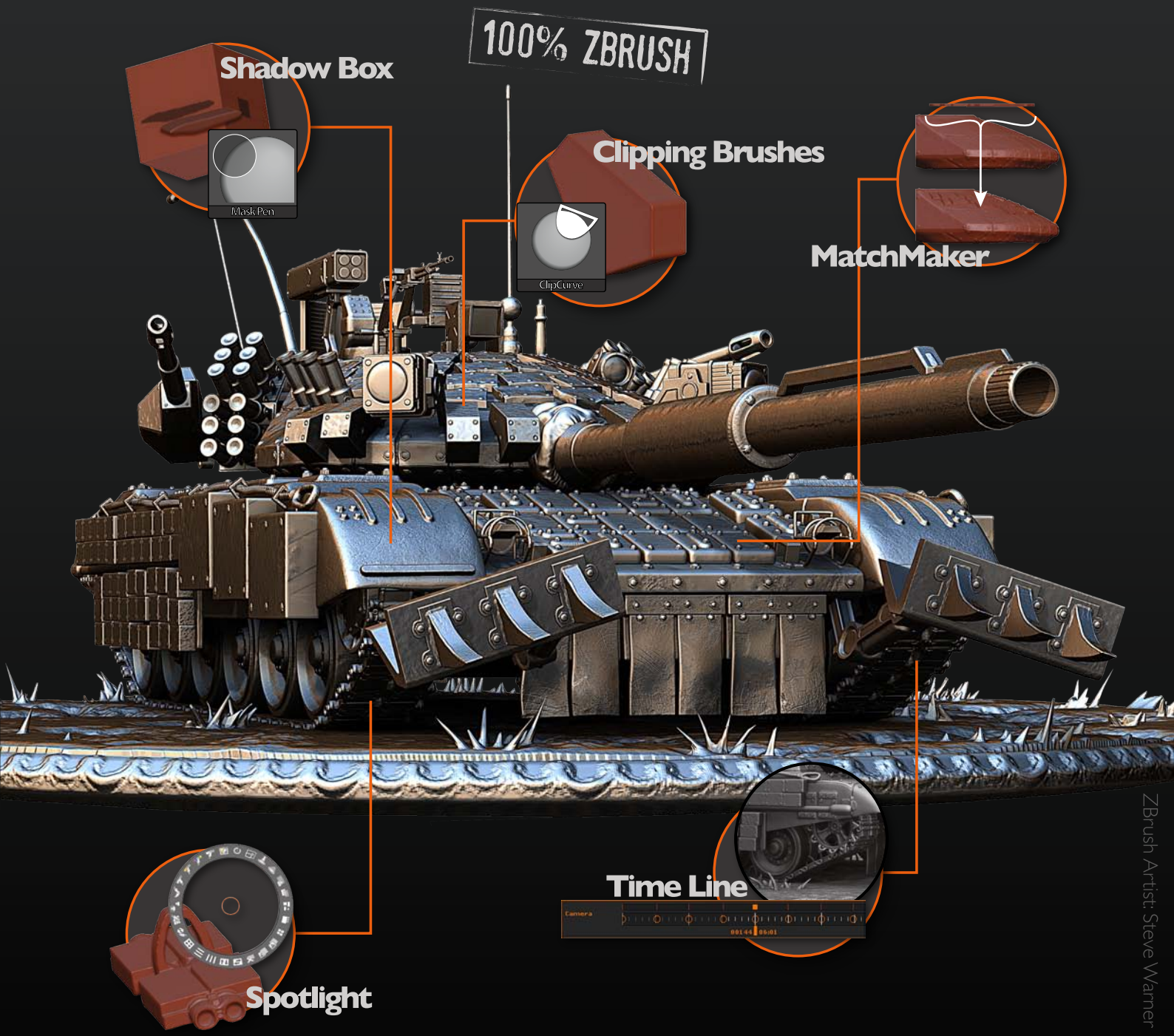
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Tomasz Strzalkowski

PK3D Studio Piotr Kosinski

Stanko Stupar

Raymond Yang

Peng Zhao

Andrzej Kuziola

Adam Grania

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Goblin Library

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Having A Meal - A Conversation With God

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Old Ship

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CREATING THE CELERITAS

SPACESHIP MODELING & TEXTURING

FOLLOW THIS TUTORIAL SERIES ON PAGE 076



COMING UP IN THIS ISSUE...

This month our artists will show you how to model the high-poly version of our spaceship.

So if you're interested in seeing the third chapter of this great series, please flip to the back of this magazine and enjoy.

- 3DS MAX - PAGE 086
- MAYA - PAGE 100
- CINEMA 4D - PAGE 120

CHAPTER 3 - HIGH-POLY MODELING

In this fascinating tutorial series our artists will be guiding us through the creation of a complete spaceship in a scene, from beginning to end. We begin the series in Photoshop, using some of its excellent features to help create a concept, a vital process for anyone hoping to come up with an original design. That design is then passed on to our team of modelers who cover the stages of low and high poly modeling, texturing and post-production. This series is filled with tips to help during all of the stages leading up to the creation of an amazing sci-fi scene with an original spaceship.

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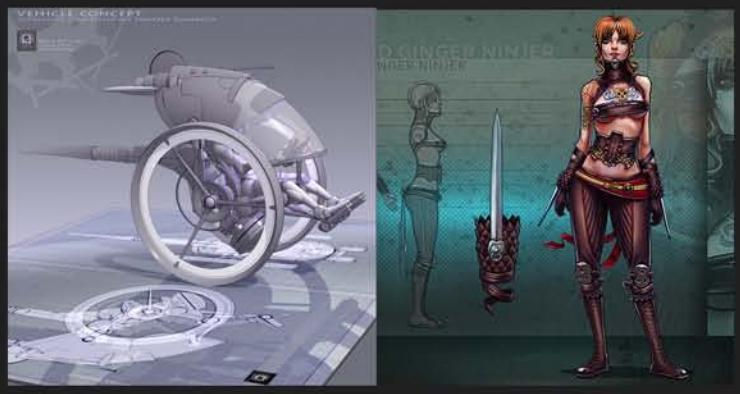
Textures



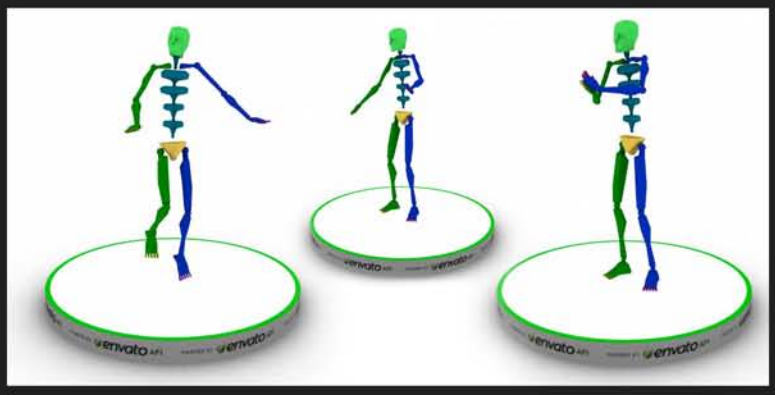
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PHOTOSHOP POST EFFECTS



Photoshop is becoming more and more important in the work flow of a 3D artist. If you are creating 3D stills using Photoshop is a great way to complete your image and add effects quickly and effectively. In this tutorial series Photoshop Pro Richard Tilbury will be showing how to totally transform an image in Photoshop. We will start each chapter with a textured 3D model. That model will then be put into Photoshop where Rich will turn it into a polished image. Using Photoshop can be daunting to 3D artists as many see is as a tool for digital painters, but Rich has provided simple step by step techniques and methods that will transform your work flow forever.

CHAPTER 1 | JANUARY ISSUE 065
Fire Effect + Heat Haze

CHAPTER 2 | FEBRUARY ISSUE 066
Sparks + Glows

CHAPTER 3 | MARCH ISSUE 067
Space

CHAPTER 4 | APRIL ISSUE 068
Underwater

CHAPTER 1 - FIRE EFFECT + HEAT HAZE

Software used: 3ds Max & Photoshop

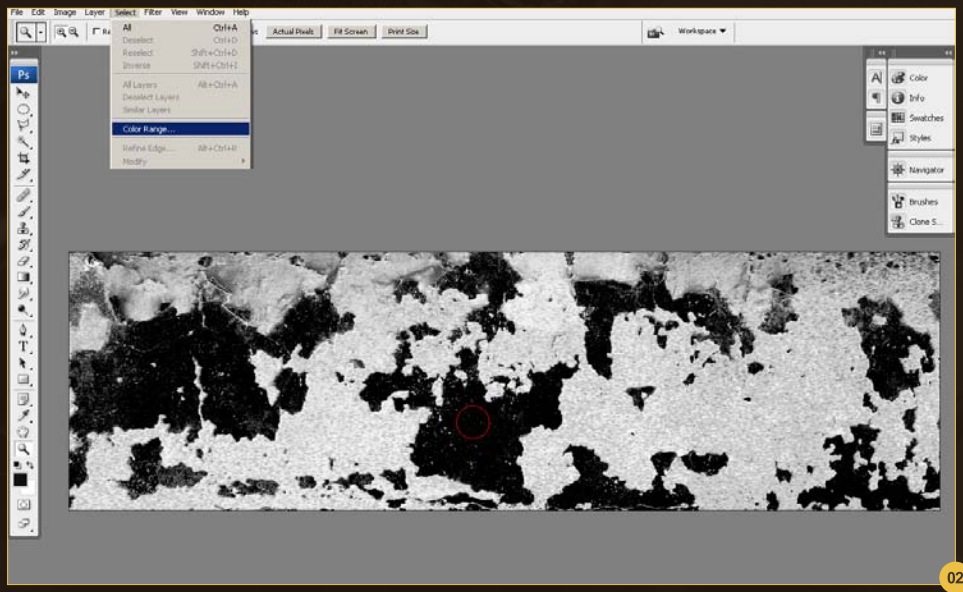
INTRODUCTION

This tutorial is aimed at the 3D artist and is designed to show how Photoshop and the principals of post-production can help enhance a 3D render. The notion behind this tutorial is to demonstrate how certain aspects within a scene can be achieved via a 2D approach and yet still work in harmony with the 3D components. In fact this method can prove far more economical in terms of time and effort, and can often yield results that are just as effective in the context of a still. During this tutorial we will look at a few ways to add some particle effects that could prove difficult and time consuming in a 3D environment. We will begin with a base 3D render, which in this case is a scene created by Christopher Tackett for the Pixologic challenge. We will transform the scene by adding some fire and smoke into the background and then apply some heat haze to the foreground.



01

Fig.01 shows the base render by Christopher, which portrays a warrior amid a barren wasteland. The color scheme and environment are perfect for a transformation into a heat-ravaged landscape of fire and smoke. I decided to have some fire emerging from behind him on the left of the picture and so the first port of call was to create this effect. As this is to be a still we can add the fire in 2D, which can work really well and save time adjusting parameters and doing intensive render tests.



02

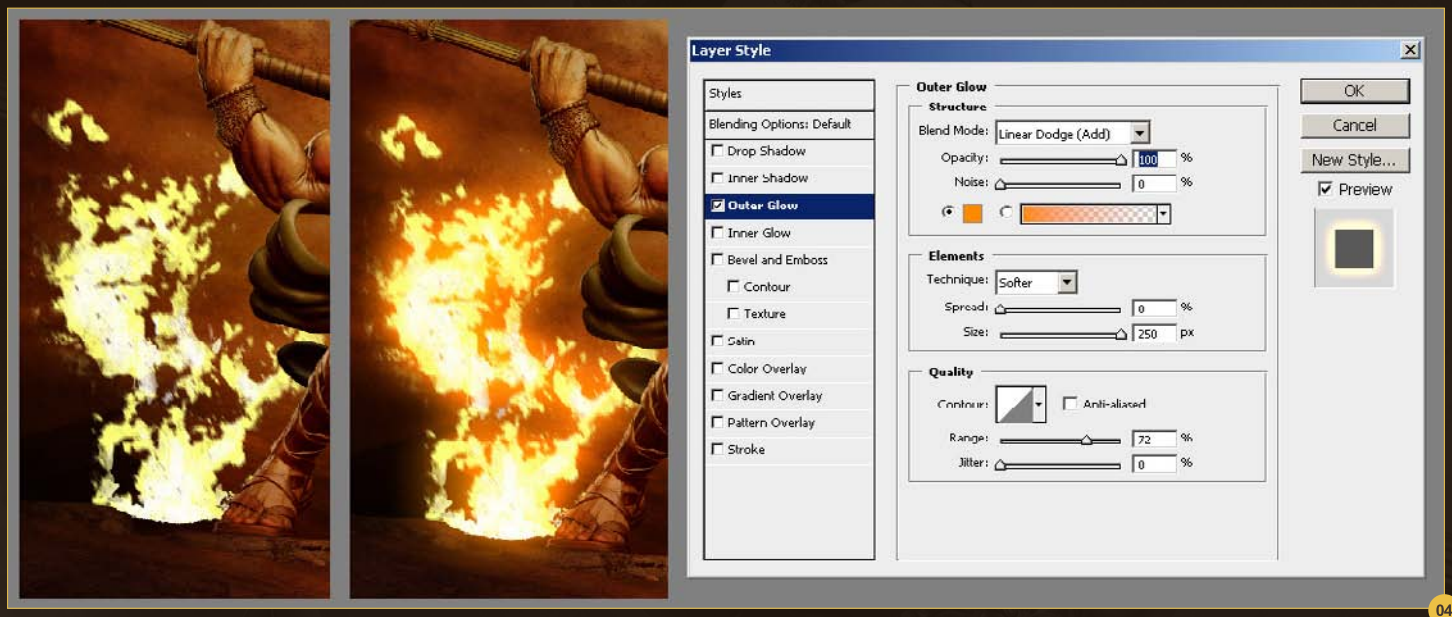
Adding any visual effect does involve an artistic eye to some degree, but hopefully these techniques will be useful to artists who are not proficient in painting and permit them to apply the methods on offer and enhance their own workflow and post work.

In order to avoid a purely manual approach I have opted to use existing maps and images to build the components. With regard to the fire I have chosen to utilise a dirt map, which can be seen in **Fig.02**.

I searched through a library until I found a pattern that most resembled flames. This particular map shows peeling paint, but the areas in black bore a resemblance to flame shapes. I selected these areas (Select > Color Range) and then copied and pasted these into the render. It is far easier in any post-production if your render is divided into separate layers so that you can quickly paste selections into different regions and still have the freedom to move things around. In this case the character was also supplied as an alpha channel and so I could paste the dirt map in behind him with ease. I selected the area behind him and then pasted the dirt map into this selection area (Shift + Ctrl + V). I then moved the different areas around to create the pattern visible in **Fig.03**.



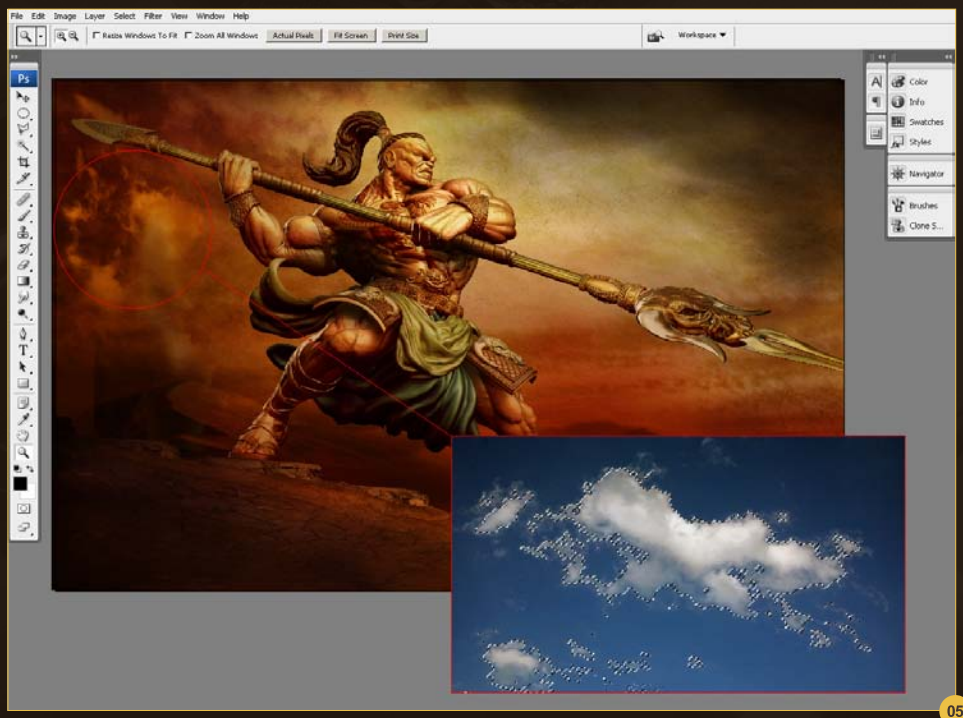
03



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The flames are essentially the black areas from Fig.02 that have been re-arranged into a different configuration using the Transform tools and the Eraser.

Once I was happy with the general shape I locked the transparent pixels on this layer (small chequer box above the Layers palette) and then filled it with a lemon yellow. Then, using a pure white, I painted in a rough area in the centre of the largest shapes. As this was meant to depict fire it needed some blurring courtesy of Filter > Blur > Motion Blur with an angle that tilted along a diagonal (see inset). To create a more intense light and heat I applied a glow effect by way of Layer > Layer Style > Outer Glow, using the settings shown in **Fig.04**.



05



06

With the flames established I needed to add some smoke and further effects to better integrate it into the scene. The first step was to add smoke, which I did by using a photo of clouds from the free reference library at: **http://freetextures.3dtotal.com/**. I made a selection area around the clouds and then pasted it into the render. It was then color corrected by way of Image > Adjustments > Color Balance and the brightness reduced so that it matched the scene. As with any section of an image it is often necessary to use a soft edged Eraser to blend it in (**Fig.05**).

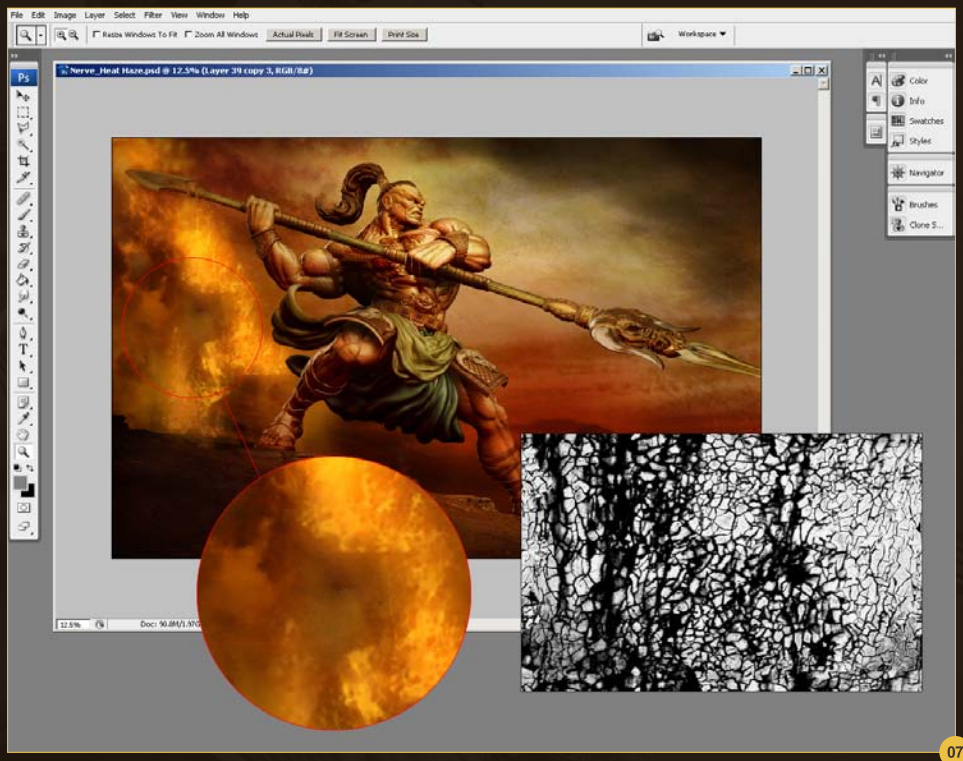
By using a few selection areas I built up a denser volume of smoke around the fire (**Fig.06**). It is always useful to keep everything on separate layers. In this case it allowed me to manipulate the different smoke components individually and move them around in order to experiment with the composition.

The next phase concerns the creation of a softer, transitional edge around the flames and making a glow that blends them with the smoke. To do this, I again used another dirt map and selected just one aspect using Select > Color

Range. I then copied and pasted the white regions into the scene and made them bright orange (**Fig.07**). As with the flames I added some blurring, but this time just using Gaussian Blur. It looks a little patchy here but when the flames are superimposed it makes more sense (**Fig.08**).

Perhaps the last aspect to add is some evidence of sparks, which were also derived from a dirt map. **Fig.09** shows the map used, which in this instance only involves the white areas. Once these were integrated I duplicated the layer and added some Gaussian Blur in order to give them a slight glow and reduce the sharpness.The next phase involves adding smoke to the right hand side of the background. I find the best way of doing this is to use photos of clouds. Again I sourced a photo from the library and chose a suitable cloud formation that could represent a thick plume of smoke (**Fig.10**). This type of cumulous cloud is perfect, but if you want to fade the smoke out you can either use a soft Eraser or select a more wispy cirrus cloud and blend the two together. Once your cloud has been copied in the first thing to do is adjust the brightness and contrast using a combination of Curves, Levels and Brightness/Contrast. When satisfied you can then color correct it using Image > Adjustments > Color Balance and Hue/ Saturation. The technique is identical to that shown in **Fig.05**.

With this done it was time to add further smoke into the background. **Fig.11** shows the addition of an extra section of smoke, which has been used to fade out the main plume nearest the viewer along with some extra plumes throughout the distance.


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To maintain a fiery and heat-ravaged theme throughout the picture I thought it would be good to transform the landscape into a scorched wasteland. To do this I used a dirt map again, which can be seen on the left in **Fig.12**. I selected the white areas only and then pasted these into the scene before scaling them down along the vertical axis to match the perspective. Using an Eraser I then deleted sections to form the patches you can see in the render.

To get the correct color I locked the pixels (see **Fig.03**) and then, using the Eyedropper tool as a guide, chose lighter versions of the scene colors. I then went to Layer > Layer Style > Outer Glow and applied the settings shown in **Fig.13** to add a sense of heat. To enhance the effect further I duplicated the layer along with the layer style and then erased everything except a few choice areas in the centre of some of the larger patches. To complete the effect I made these remaining areas bright yellow.

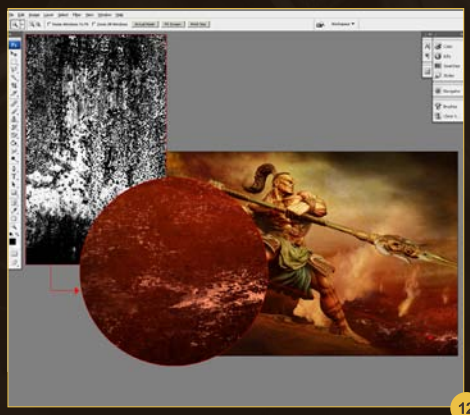
Fig.14 shows the before and after effects of the secondary glow.This completes the background section of the scene, but because I have added an extra source of light via the fire this should be reflected in the character by way of some rim lighting. A quick and easy way to do this is to first select just the character, and on a new layer fill the selection area with a suitable color (in this case a yellow to mirror the fire - see upper image in **Fig.15**). Go to Select > Modify > Contract and add a value that creates an appropriately sized boundary within the outline of the character.

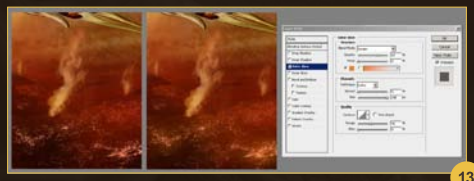
Next go to Select > Modify > Feather and enter a value between 10 and 20 depending on the size of your image. Hitting delete will reveal a soft edged border around the character as seen in the lower image.

After following this process I changed the blending mode to Soft Light and then duplicated the layer to exaggerate the effect. To add a sharper edge of light, I repeated the above steps and tried reducing the number of pixels when modifying the selection area whilst ignoring any feathering. The upper image in **Fig.16** shows such a layer that, when combined with a few feathered layers, adds stronger highlights along the extreme edge of the warrior. You will notice that sections of the edge have been erased where there would be less light so be mindful of this when using this technique.

Fig.17 shows the cumulative effect which involves a few layers incorporating different

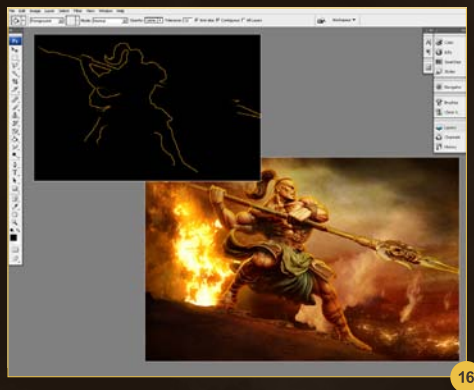

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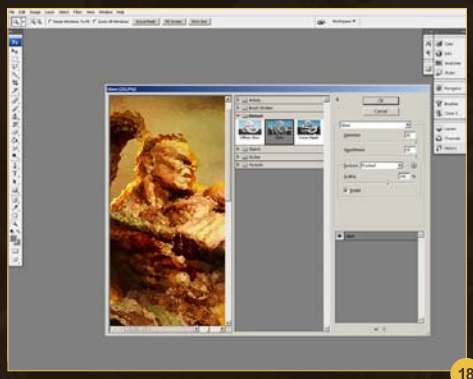

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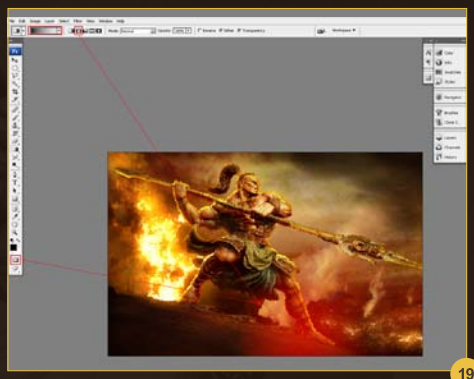

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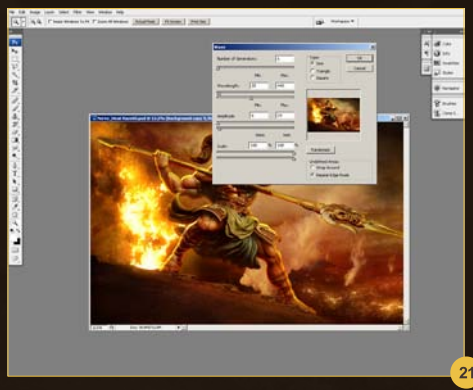

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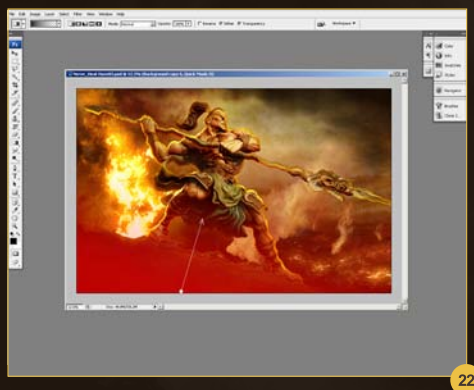

19

selection settings. There is no formula to creating the perfect effect but with some experimenting and some considered use of the Eraser you can quickly achieve a satisfactory result without the need for manual brushwork. The last aspect that will help enhance the fiery environment is some evidence of heat haze which can be done using a combination of two filters. The first step is to flatten the image and then duplicate it. Once done, I selected the new layer and went to Filter > Distort > Glass. The settings will vary according to your scene but these are the ones I applied in this case (Fig.18). The Frosted texture is the best option but the Scaling will wholly depend on the scene.

Obviously you cannot have a heat haze across the entire image as it would look unrealistic and so I focused it along the foreground. I duplicated the distorted layer and then, in Quick Mask Mode, selected a Foreground to Transparent Radial Gradient and dragged a circle around the base of the right foot as shown in **Fig.19**. Switching to Standard Mode I then deleted the area around the foot and repeated this on the duplicate layer for the area around the left foot. The two layers could now be merged and the before and after effects of this distortion can be seen in **Fig.20**.


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One final filter that will complete the effect is a Wave, which is also found under the Distort menu. Again the settings for this are entirely dependent on the scene and image size; however these are roughly the ones I applied in this instance (**Fig.21**). Again to limit this filter to a specific region I duplicated the flattened layer and then applied the Wave to this. I wanted to restrict it to the extreme foreground and so, using Quick Mask Mode, I dragged a Linear Gradient from the bottom of the canvas up to the knee region at an angle that matched the ground (**Fig.22**). Back in Standard Mode I then deleted the upper section and merged this layer



with the Glass distortion. I applied a little Gaussian Blur to the distortion and then flattened the PSD file, resulting in the final version (**Fig.23**).

I hope that this tutorial has offered some useful tips on creating complex particle effects in Photoshop and shown that post work can prove a viable alternative to 3D.I would like to extend my thanks to Christopher Tackett for allowing the use of his great artwork for this project.

Richard Tilbury

For more from this artist visit:

http://www.richardtilburyart.com

Or contact them at:

rich@3dtotal.com



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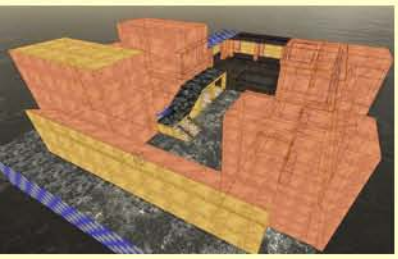
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Chapter 3 - Static Meshes and Texturing Part 1

Chapter 1 | November Issue 063
Project Planning & Software Explanation

Chapter 2 | December 064
BSP Creation - Draft lighting

Chapter 3 | This Issue
Static Meshes and Texturing Part 1

Chapter 4 | February Issue 066
Static Meshes and Texturing Part 2

Chapter 5 | March Issue 067
Layout - A

Chapter 6 | April Issue 068
Layout - B

Chapter 7 | May Issue 069
Lighting and Post Effects - A

Chapter 8 | June Issue 070
Lighting and Post Effects - B

The video game industry continues to thrive and grow at an alarming rate, and is swiftly becoming the most obvious option for employment for anyone in the CG industry. This brand new series of tutorials provides an opportunity for anyone trying to get into the business to learn how to create a basic game level portfolio piece that would impress any potential employer. Using the Unreal Development Kit, UK-based artist Andrew Finch talks us through the entire creation process, from downloading the free software and choosing its settings, to importing and texturing accessories. This really is a must have for anyone interested in gaming or game design.

UNREAL GAMES ENGINE TUTORIAL - CHAPTER 3: STATIC MESHES AND TEXTURING PART 1

Software used: UDK (Unreal Development Kit)

Welcome to the third chapter of this tutorial series. I will be covering the process of creating an asset from scratch in 3ds Max, texturing it in Photoshop, and then I will show you the export process to put it into your game. I will also cover how we should organize our custom asset collection into packages and sub-folders.

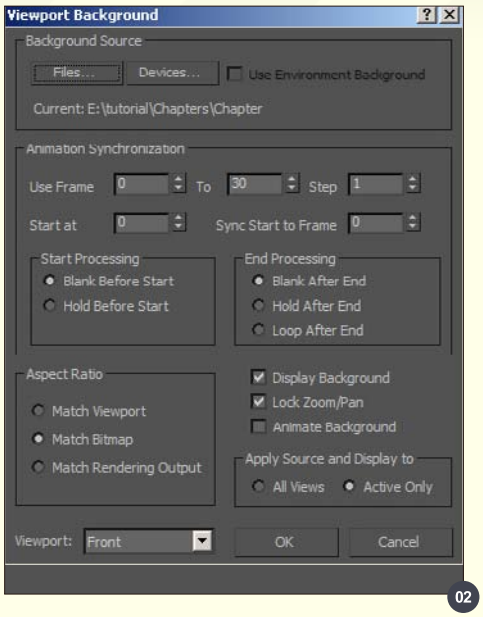
For this tutorial I would expect you to have knowledge of 3ds Max and a basic knowledge of the rules for creating game assets.

Here is a reference I have collected for our wooden gate (**Fig.01**).

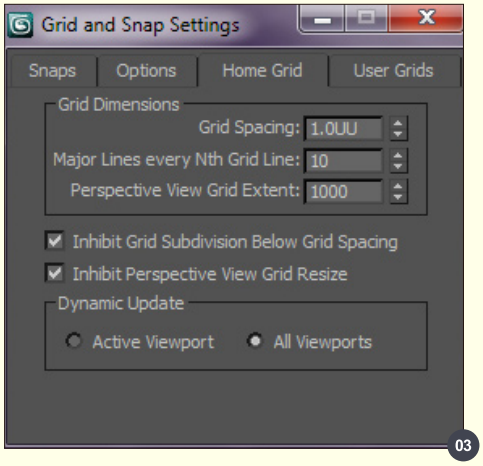


01

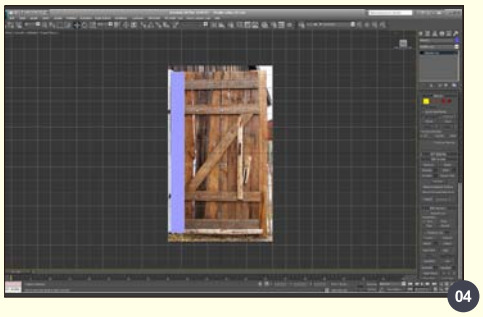
This reference image is perfect for the look I want to achieve: a weathered old gate. I do want to add some color to the asset so I won't keep it bare wood, I will add paint to the gate to add some spot color to our final composition.



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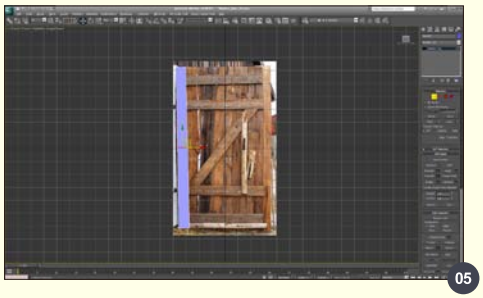
CREATING THE MODEL

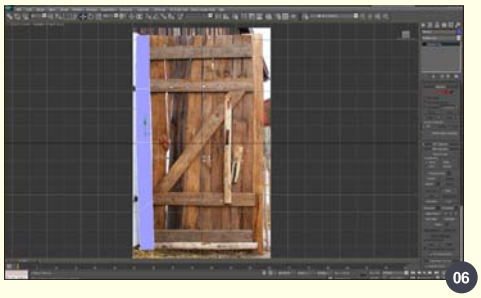
With 3ds Max open, select the front viewport and then click View > Viewport Background. A new window should open (**Fig.02**).

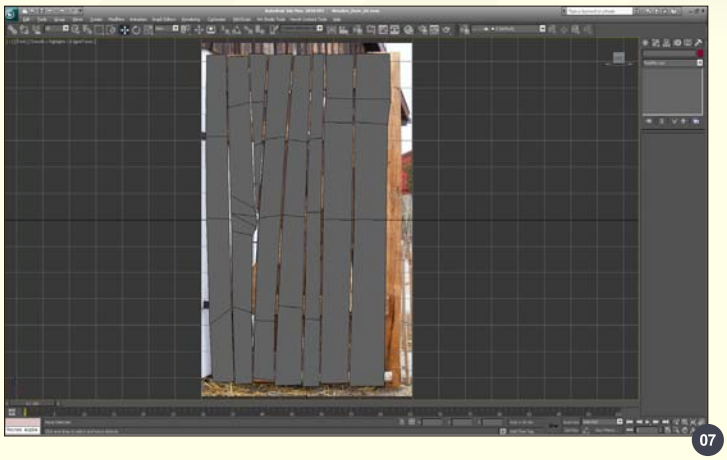
Click the Files button in the Background Source section of the window, and navigate to the reference image we are using. With this window still open we need to make sure we click the tick box for Lock Zoom/Pan. This option locks the image in position, and allows us to pan and zoom around the viewport while keeping the image in the same position, allowing us to model around the image perfectly. Click OK and you should see the image in the front viewport.

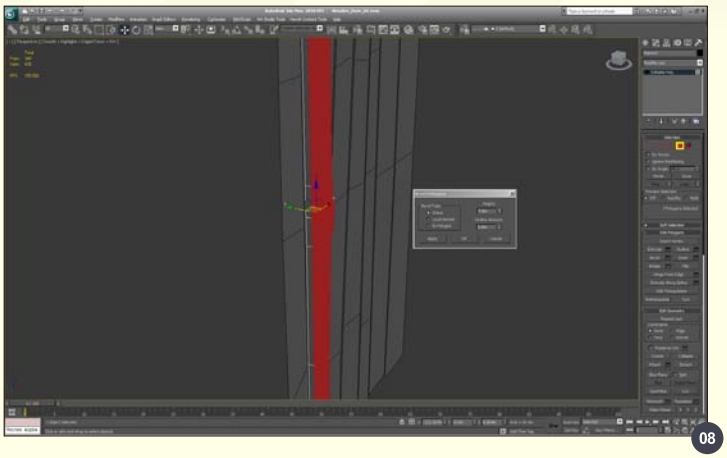
We need to set up the units correctly so that what we create in Max is a good representation of what will appear in Unreal. In Unit Setup, select Custom type in UU (Unreal Units). In the Value option type 2.54 and select Centimeters. Now select System Units and type in 1 Unit = 2.54 centimeters. In Grid and Snap use these settings (**Fig.03**). With these settings, 1 unit in Max should equal 1 unit in Unreal. A typical height for a character is 96 units, so you can use this measurement as a guide. Time to start modeling! For games models you have to be clever about how you use the very limited polys to get the best looking result as "cheaply" as possible. It's best not to make your mesh too triangulated because this will open doors for lighting errors later on in the project. Create a plane and turn it into an editable poly. Make it almost the same size as the first wooden plank that makes up the gate (**Fig.04**).

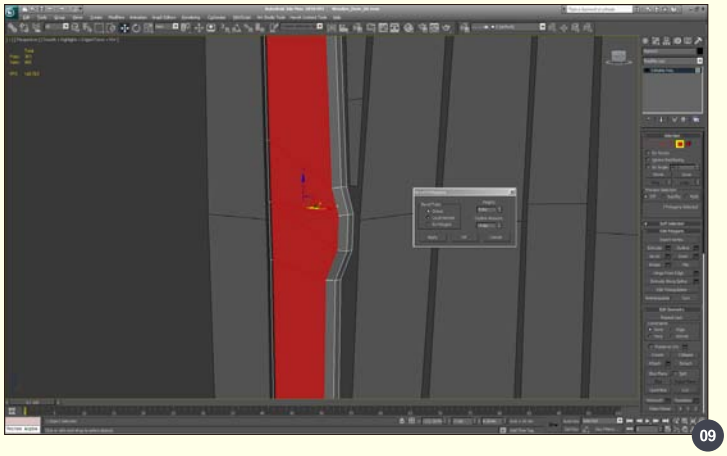
Next select the vertical edges of the mesh and click Connect in the Editable Poly tools. This will add a horizontal edge and two extra verts, which will allow us to make more precise edits to the mesh and helps us follow the outline of the plank of wood (**Fig.05**).

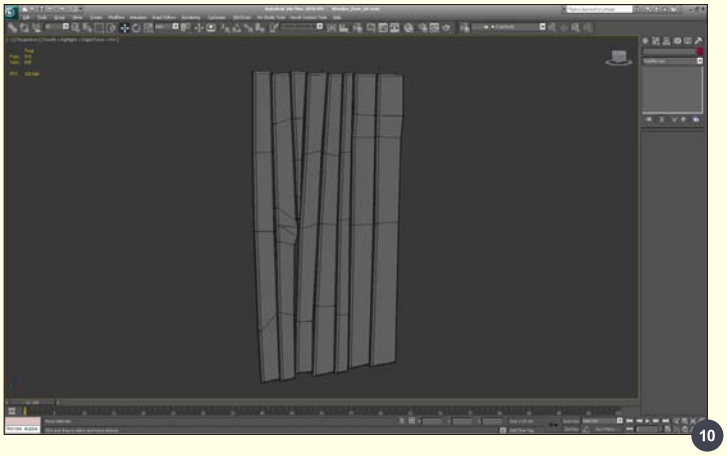

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Do this a few more times until you are happy you have created a mesh that matches the reference image (**Fig.06**).

Using this technique, continue the process for the rest of the vertical planks that make up the gate. Try to keep it basic. Remember that this is a game model so don't get too detailed with the cuts. You should end up with a group of meshes that fit the silhouette of the gate's planks (**Fig.07**).

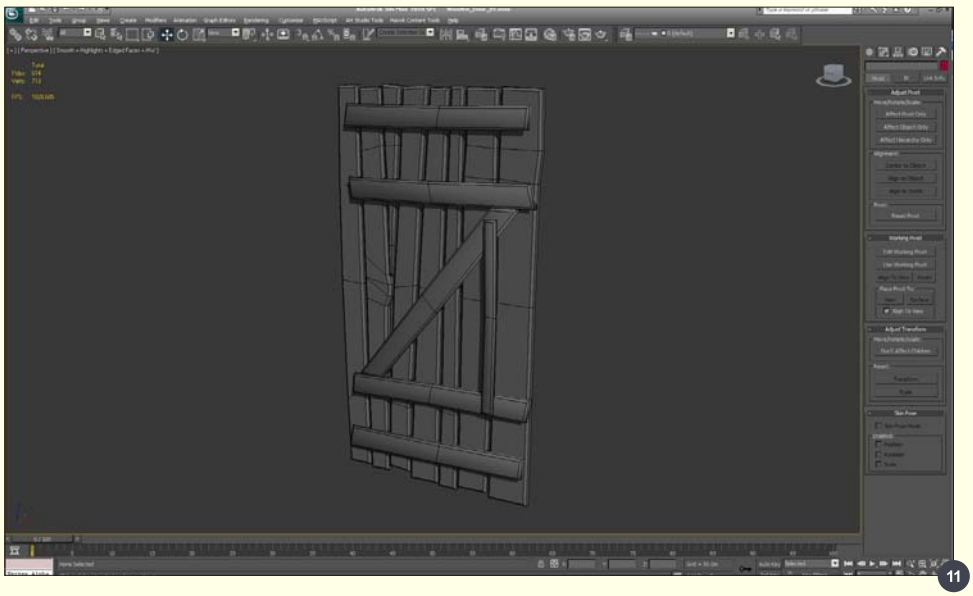
Select one of the planks and all the polys of that plank. In the Editable Mesh tools, click the options button next to the Bevel tool. This will open up a new window and allow us to type in measurements to extrude and scale the polys that make up the plank.

For Height I used 7.0 and clicked Apply (this applies the setting but keeps the tool open to allow us to continue editing) (**Fig.08**).

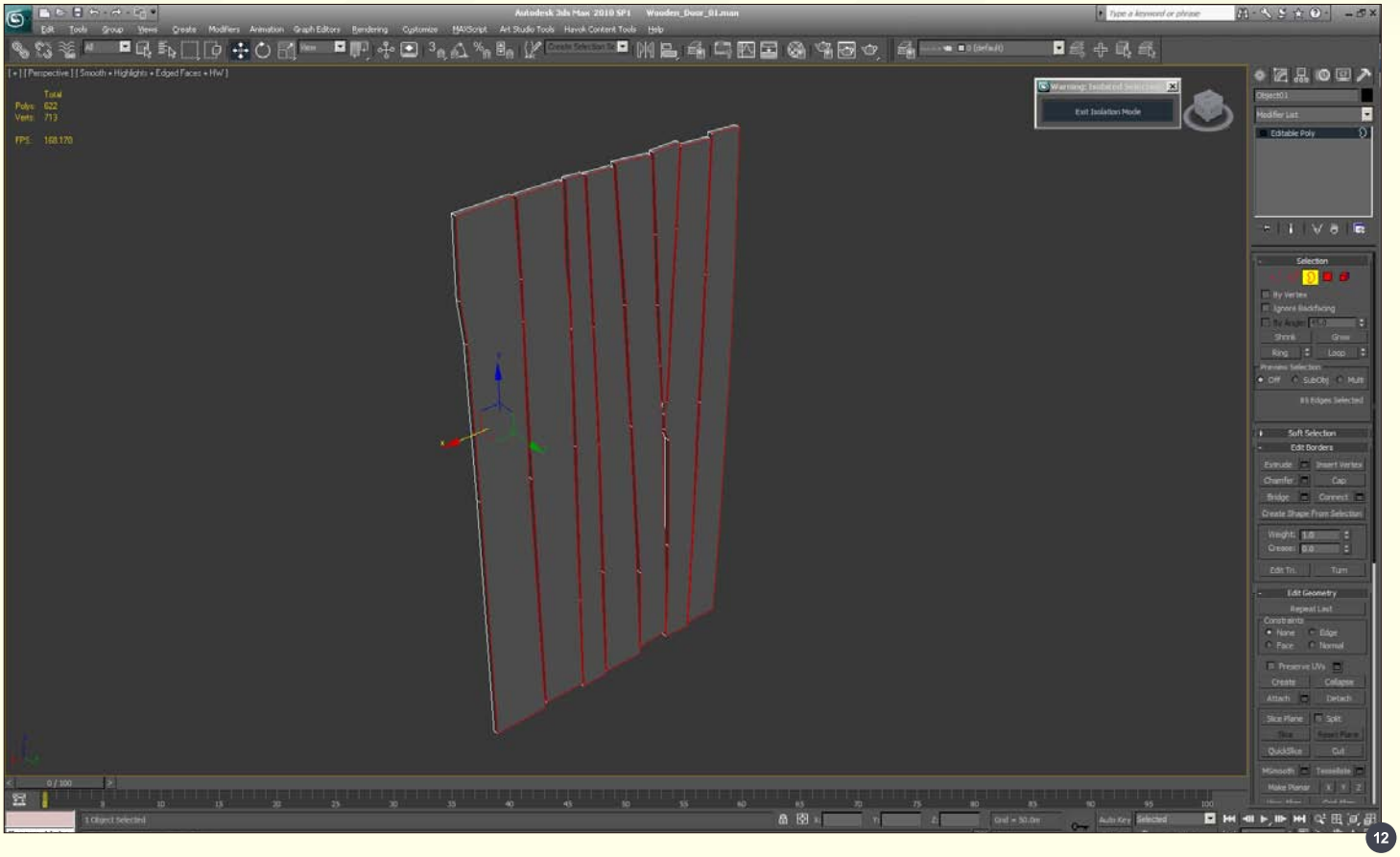
I then used 4.0 for the Height and -4.0 for the Outline amount. As you can see the mesh now has a softer edge, which will help achieve the rustic worn look we are after (**Fig.09**).

Continue using this method for the remaining meshes (**Fig10**).

To finish modeling the gate we need to add the horizontal planks. Using the above techniques, model the remaining planks in the reference image (**Fig.11**).


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Select one of the planks. In the Editable Poly tools click Attach and then select all the remaining planks so we have one complete model. The back of the planks have holes in them which is not good, and can cause lighting issues later on in the project. In order to stop any lighting errors from appearing we need to fill

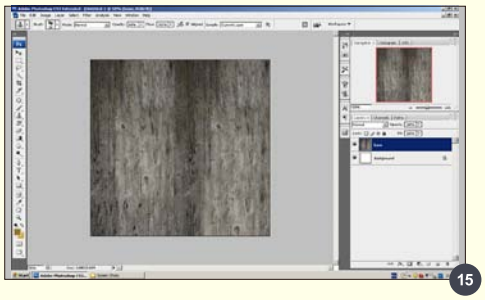


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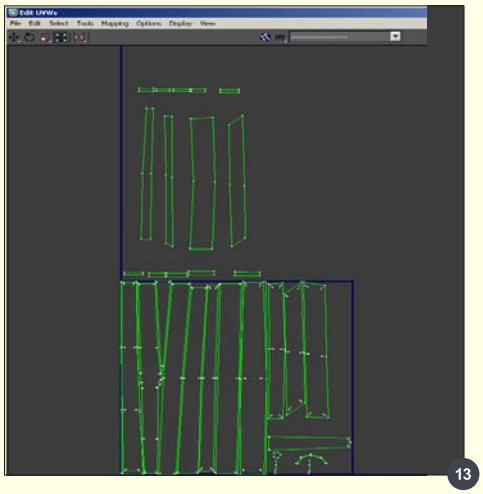
in the hole, so select Border in the Editable Poly tools and select all the planks. In the Editable Poly tools select Cap. This will then fill in the holes with polys and hopefully not give us any lighting errors (**Fig.12**).

To UV the gate model we want to make sure the front of the gate uses up all the space available in the UV window, and the back panels can use the space outside the UV space. This is because you will never see the back of the gate so we don't need to waste space or time mapping it. In **Fig.13** you can see how to lay out the UVs.

Unreal uses a second mapping channel for its light baking so, in the UV Edit tool, select

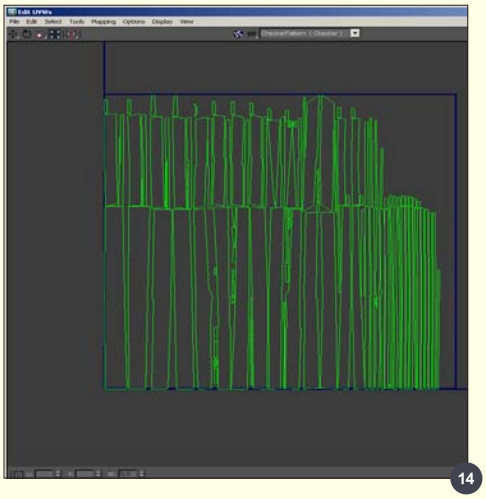


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13

Mapping Channel 2. Then select all of the faces of the object and click Mapping > Flatten Mapping to bring up the Options window. We can use flatten mapping to quickly and neatly map each face within the UV space.Change the spacing option to 0.002. This will pack all the faces close together and make best use of the space available. Your UV window should look similar to this (**Fig.14**). Render out the UV window that is available in the tool's options. This will aid us later when we are texturing the gate.



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To export to UDK we need to export the asset in the correct file type. Select the gate and click File > Export Selected. In the Export window name the asset "Gate" and change the file type to ASCII Scene Export (9*.ASE). UDK can now recognize this file and import it into the engine, which I will talk about more later in this tutorial.

Creating textures

Here is the base texture in Photoshop before it has been edited in any way (**Fig.15**). We want the gate to look like it once had a coat of

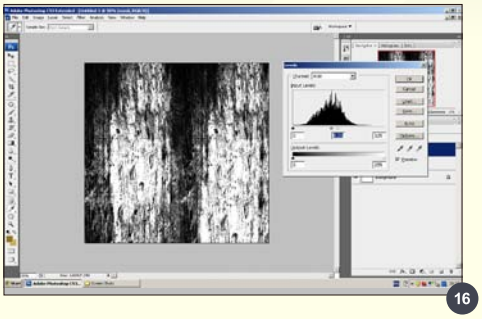
paint on it that has been worn away over time, exposing the wood beneath it. So in order to do this we need to create a mask for the paint.

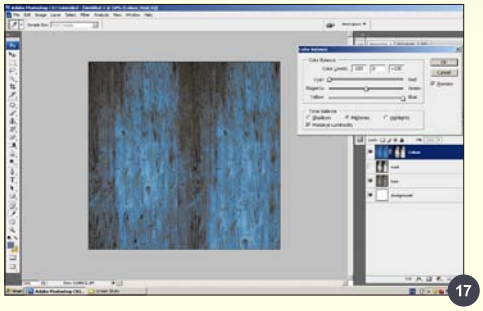
The easiest way to do this is to desaturate the texture so it is grayscale, and then adjust the levels and create a strong definition between the black areas (the wood) and the white areas (the paint). Use the values shown in **Fig.16** to get a good balance of paint and wood.

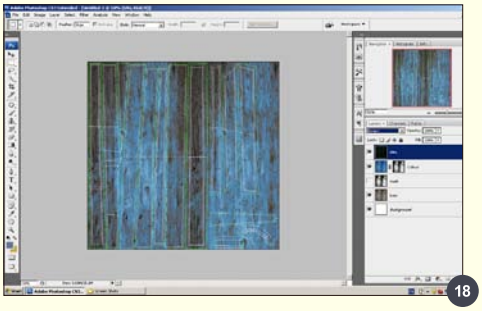
You can now hide the mask as we don't need it at the moment. Create a duplicate of the base texture and name it "Color" (this will be our paint layer). Adjust the Color Balance until you get the color you have chosen. I went for a cyan/light blue color. At the moment this color is applied to the whole of the texture, so we need to use the mask we created earlier to reveal the wood beneath and the Color layer still selected. Add a New Layer mask and then copy and paste the mask layer into the Layer mask (**Fig.17**).

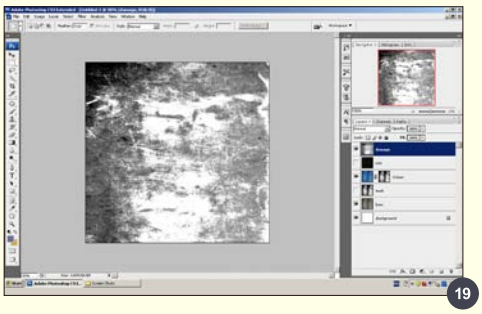
As a guide I like to import the rendered out UV texture so I can see what parts of the texture will show on the model. Also, if I want to paint in anymore detail I will know where to do it. So set the layer to Screen so it removes the blacks from the texture (**Fig.18**).

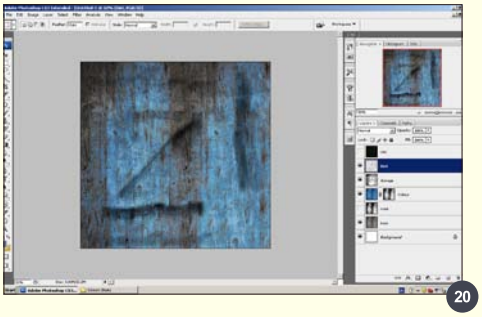
To break the texture up let's add a layer of damage and dirt. Using a scratched grungy texture, make it grayscale and then set the layer to Multiply. Adjust the Opacity to get the desired effect. It's also good to paint in some heavier dirt by hand. Using the UV texture as a guide, paint in some dirt around the areas you think would most likely collect dirt, such as the base of the gate and in the corners of the cross beams (**Fig.19**). Adjust the Opacity of this layer if it becomes too heavy; subtlety is the key to creating a realistic texture (**Fig.20**).

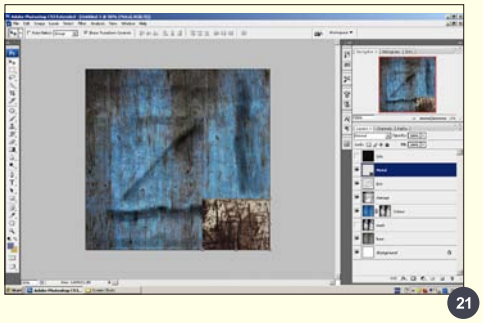

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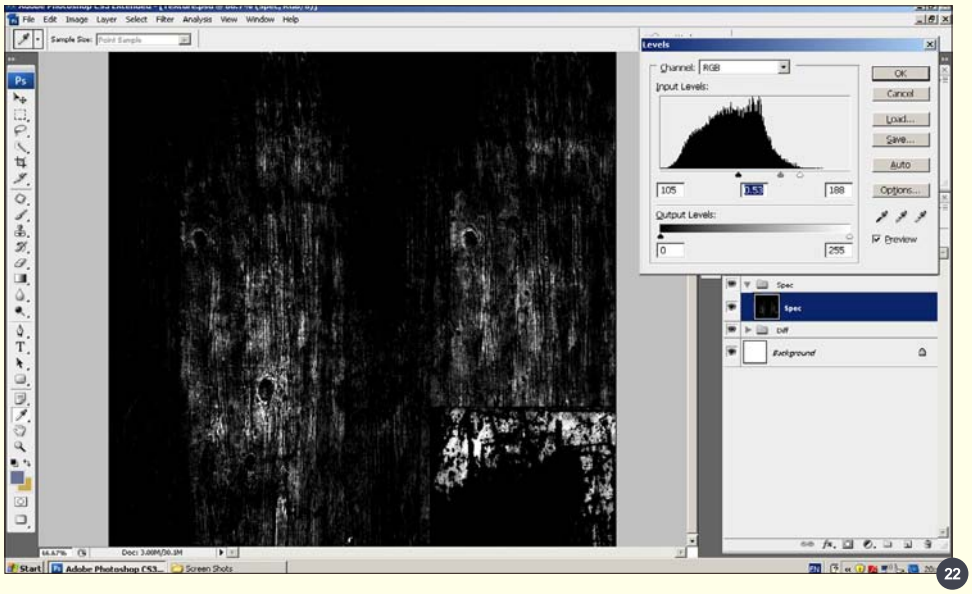

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Add some rusty metal texture in the bottom corner of the texture as this will be used for the hinges and handle. You don't need to spend much time on the metal as it won't be very visible on the asset and once it is in the scene it won't make much of an impact (**Fig.21**).

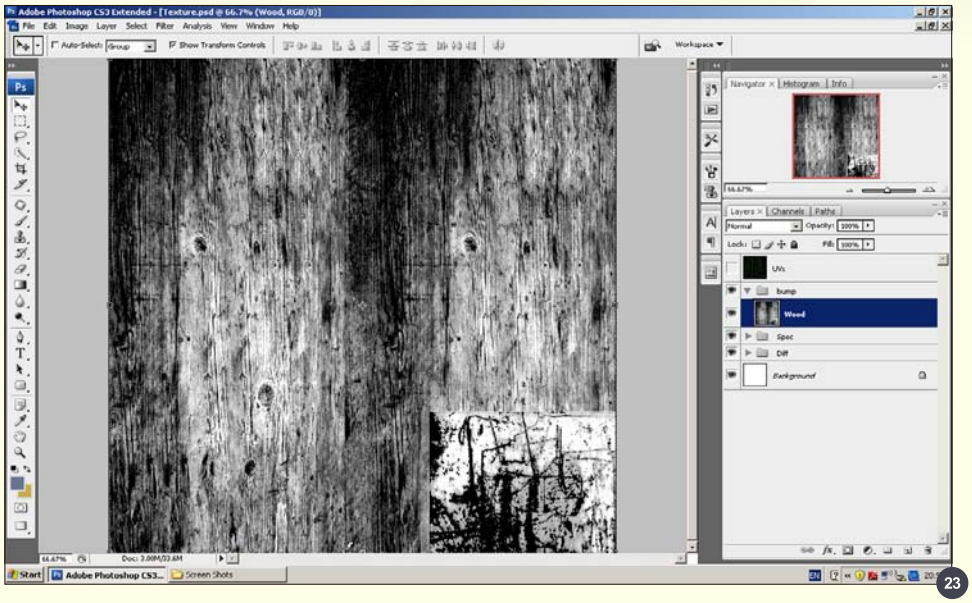
The diffuse texture is now complete so we need to create the specular and normal maps. For the specular, duplicate all the layers and collapse them into one. Also it's a good idea to organize the Photoshop documents into folders so everything is in its right place. Desaturate the specular layer and adjust the levels to create something similar to **Fig.22**. The paint should reflect a bit of light and therefore be a bit lighter.

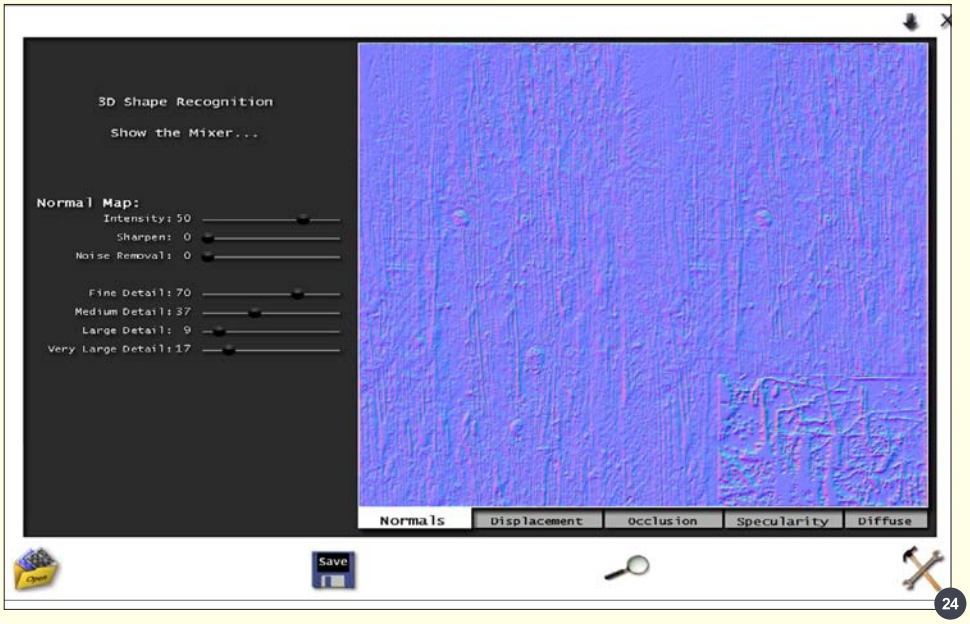
To create the Normal map we first need to create a Bump map. A Bump map is a grayscale texture that allows you to add height information



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in a material. Games use Normal maps to create this height so once we have created the Bump map we will convert it to a Normal map using CrazyBump. The Bump map should look similar to **Fig.23**. Import this image into CrazyBump and adjust the sliders to create the required look in the preview window. The settings shown in **Fig.24** create a good result in Unreal. Save this Normal map out of CrazyBump.


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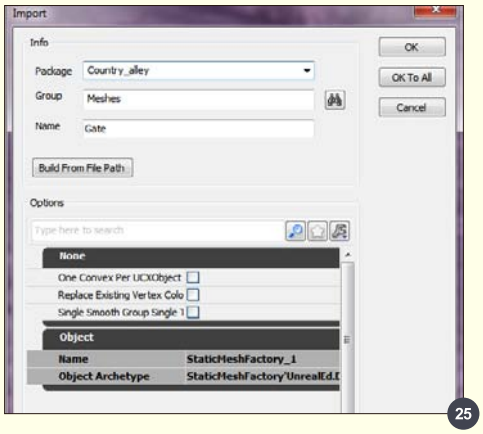
24

Importing into the Game

Now the fun bit - putting your artwork in the game engine! Open the scene from the previous tutorial. We will be using a lot of assets to create our environment so we need to start as we mean to go on. Keep things organized and in the correct folders.

In the Asset Browser, click Import and this will bring up the Import options (**Fig.25**). Name your package the same as your Level name so you can easily find it later on. In Group, label it as the type of asset you are importing. In this case I called it “Meshes”. Lastly enter the name of the asset, in this case “Gate”, and click OK. The asset will now appear in the Asset Browser and under the folder structure you just created.

Now do exactly the same process and import the three textures we just created, keeping the same package name. In Group enter Textures, and in Name enter the name of the textures. You will see this adds a new folder to the directory called “Textures” and your three textures are now stored here.



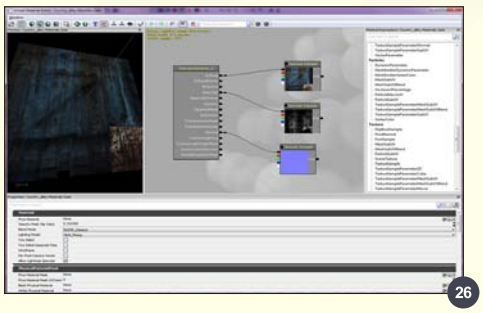
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In the Asset Browser, next to Import, there is another button called New. Click this button and select Material. As above, name the material correctly and create a group called “Materials”. A new window should appear. If not, double-click the newly created material and then a new window will appear. This is your blank material ready for us to set up and import our textures.

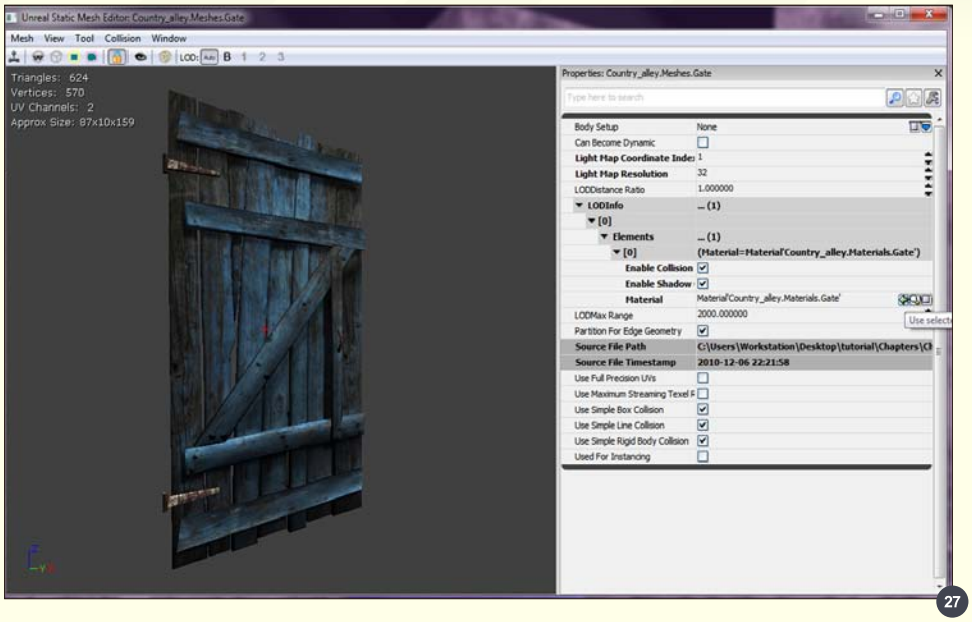
In the Asset Browser select the diffuse texture so it is highlighted yellow. Then return to the material and on the right, scroll down the list, select Texture Sample and drag it into the blank area. The diffuse texture should be displayed in the Texture Sample. Click and drag from the black node of the Texture Sample to the diffuse slot of the material. Do this for the remaining textures and link them to their appropriate channels.

You can now close the material. It should look like this (**Fig.26**). This is a very basic setup for a material. They can get quite complicated and create some stunning results. I will go into more detail in next month’s tutorial about creating a more complex material, but for now this serves its purpose.

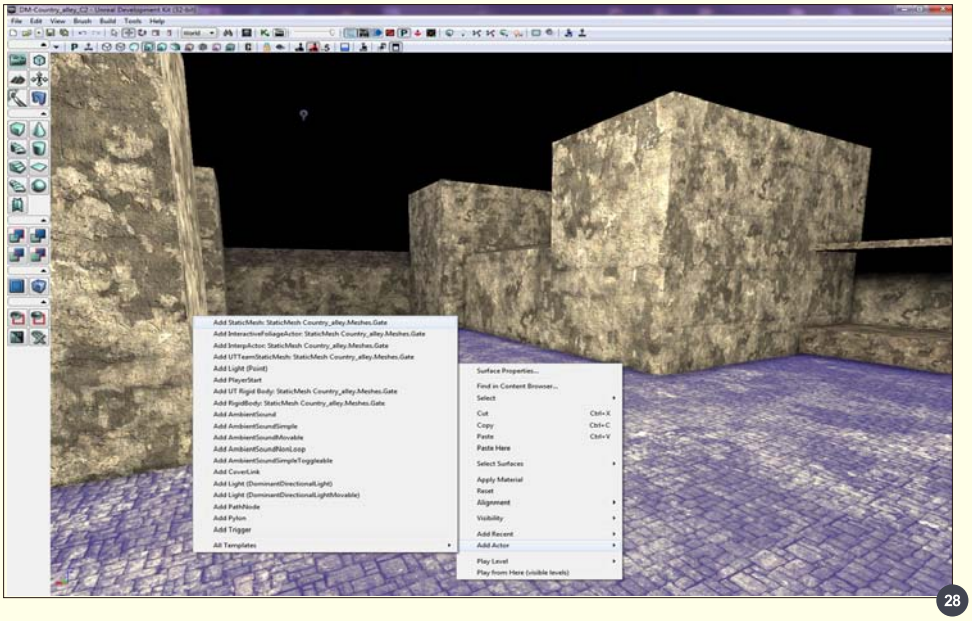
Double-click the gate mesh in the Asset Browser to open its options. On the right, expand the LOD Info settings until you find the material slot. In Asset Browser locate the newly created



material and select it so it turns yellow. Return to the mesh setting and click the green arrow in the Material slot; this will apply the gate material to the gate mesh and you should see the fully textured gate in the preview window on the left (**Fig.27**).



To get the gate asset into the game select the gate mesh in the Asset Browser, then navigate to a space in the camera viewport and right click on the floor. Select Add Actor then Add Static Mesh Country Alley > Meshes > Gate. The gate asset will now appear in the camera viewport, fully textured (**Fig.28**).



To view the finished gate in-game you have to build the lighting and geometry again (remembering to de-select Lightmass in the light settings - refer to previous tutorials on how to do this). Then click the small Joystick and you will be able to see the gate asset in-game and fully textured (**Fig.29**).

As you have seen it is quite simple to get your artwork into the Unreal Engine. In the next chapter I will continue to look at the creation of assets and how to import them into Unreal. Until then you should work on creating your own assets.



ANDREW FINCH

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VFS student work by Thiago Martins



ZBrush Monster

Character Creation

Chapter 4
Volcano Monster

ZBrush is becoming more and more powerful in the world of 3D, with many artists now embracing its flexibility and hands-on approach to sculpting characters. ZBrush monsters are slowly starting to dominate the CG forums and galleries across the internet and in this six part series we have invited some ZBrush pros to show us how it's done! Each artist has been given a specific environmental condition as a starting point and has sculpted a monster based on that idea, accompanied by a step-by-step tutorial detailing the creation process from concept through to completion.

Chapter 1 | September Issue 062
Mountain Monster

Chapter 2 | November Issue 063
Sewer Dwelling/Swamp

Chapter 3 | December Issue 64
Subterranean

Chapter 4 | This Issue
Volcano

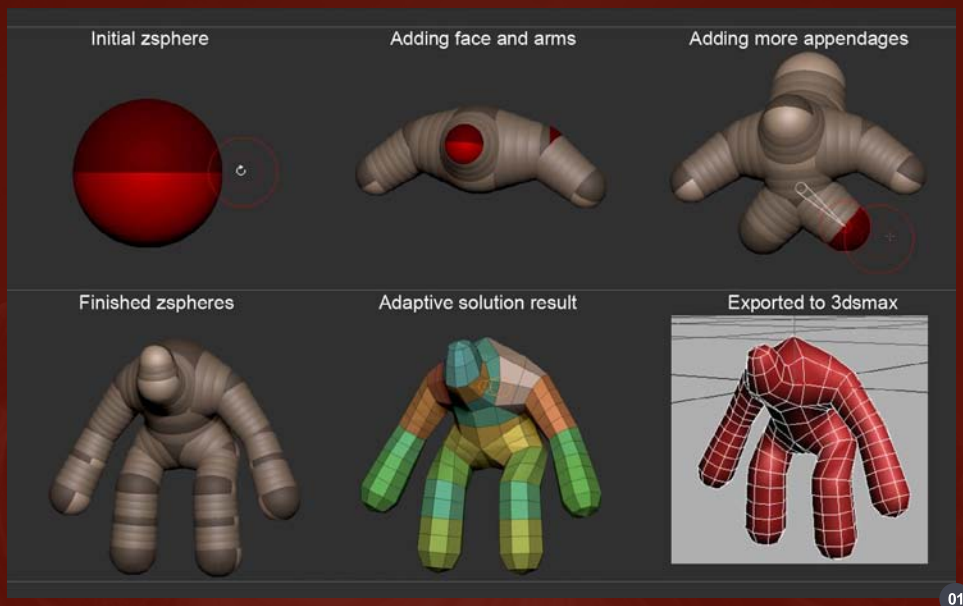
Chapter 5 | February Issue 066
Aquatic

Chapter 6 | March Issue 067
Jungle

Chapter 4 - Volcano Monster

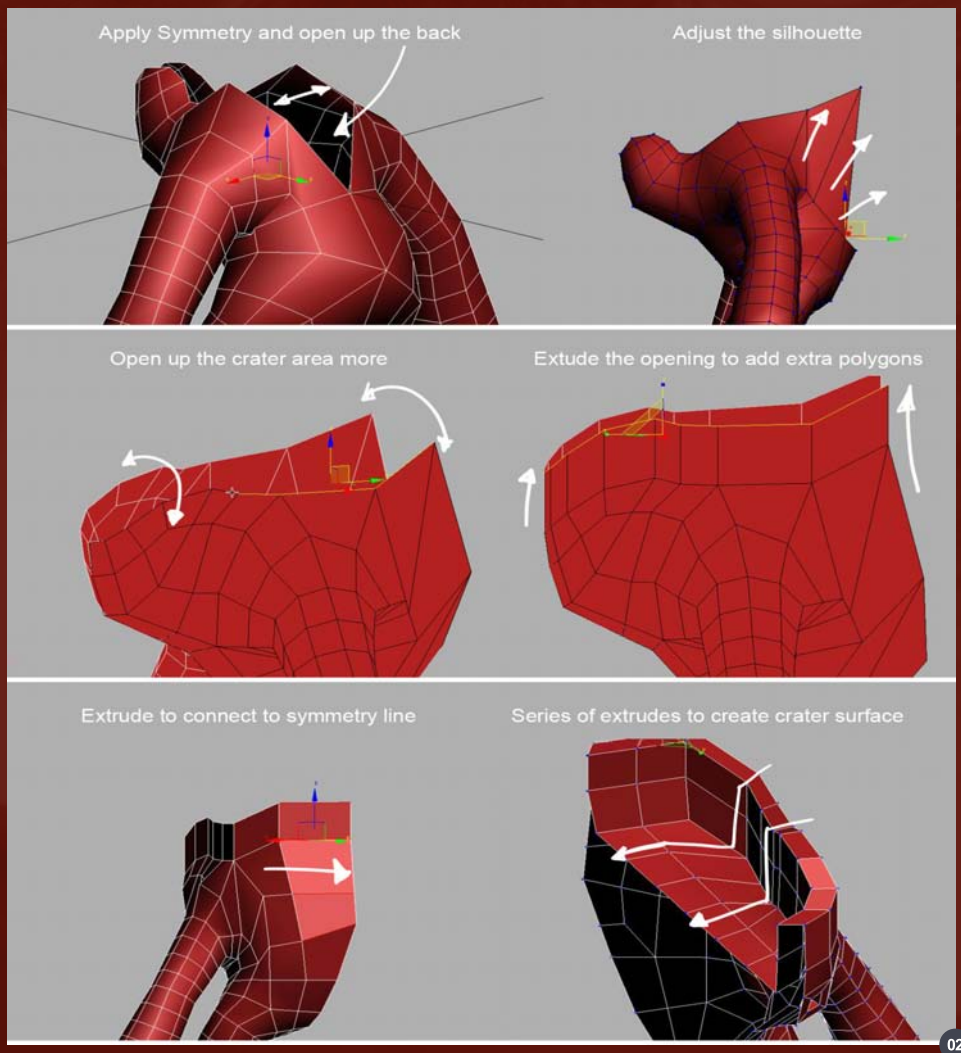
Software used: ZBrush

When I first started thinking of concepts for volcano monsters, I knew I wanted to try creating a big, burly, walking version of a creature. To capture this I knew I needed to incorporate key design elements like the blown top, flowing lava, and cratered surfaces all over. Also, I wanted the monster to have a little personality, emotion, and movement so I planned on posing him out as well. To round everything off, I decided I would add a base so that he felt grounded and part of an environment.



01

ZBrush is the perfect tool to create such a character. I started off in ZBrush 3.5 and about halfway through the process I received my ZBrush 4 upgrade so I was able to use some of the new features now available. As far as reference material goes, just look up volcano or lava keywords on an internet search engine to find some really great photos. I can't post them here for copyright reasons, but I just wanted to let you know that's how I found my unique reference. I just don't happen to have an active volcano in my backyard unfortunately!



02

To begin in ZBrush 3.5, start with a single ZSphere and start adding arms, legs and a head. Once you have a simple low-res adaptive skin solution from the ZSpheres, export it out as an .obj file and import it into 3ds Max to edit the mesh. This is purely a matter of preference at this point as I'm just faster with topology editing in 3ds Max.

Next open up the back faces and extrude a crater on his back. Then add some eyeholes and more tessellation for the mouth area. The


03

main focus at this point is to have a good, even spread of the quads and a decent flow of topology that will work well in ZBrush. This doesn't have to be a perfect representation of my design right now as we just want to have something to get started with in ZBrush (Fig.01 – 03).

Once the rough base mesh is complete, export it back over to ZBrush to get the rough blocking started. This part of the process can actually take up the most time as it's where we're really "finding" the character, and there is a lot of pushing and pulling around of the silhouette and proportions. For this phase you really only need to use a couple of different brushes: Move, Smooth, and some Inflate and Clay. Also it's a good idea to do some quick polygroup setup on the arms and legs so you can quickly isolate these areas for a more efficient workflow.



04



05

We're purely focusing on the silhouette, weight, center of mass and overall proportion (arm length, leg length and head location) for this phase. Once your pleased with the shape, start honing in on the body masses by using the Clay brushes.

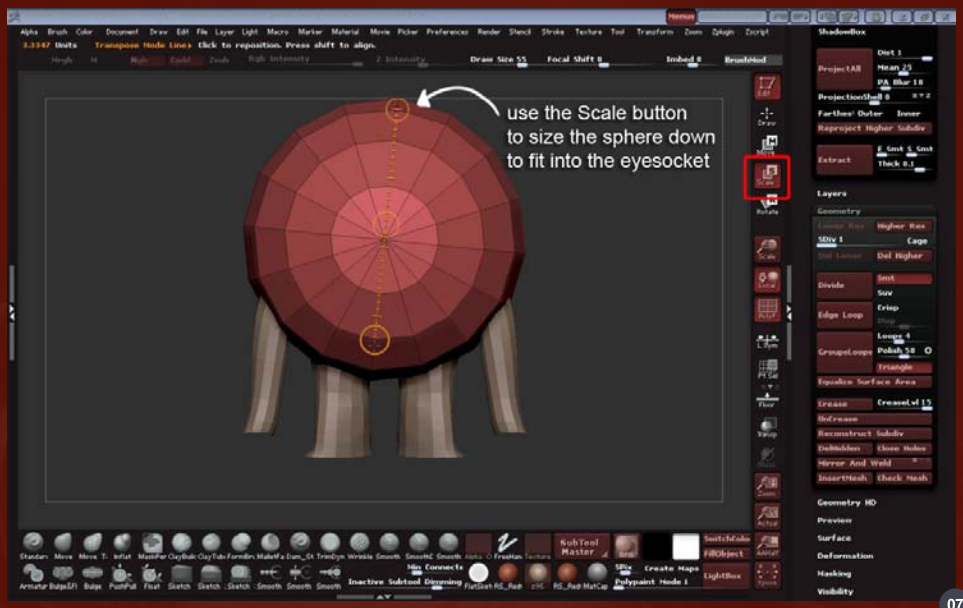
NOTE: This is when I got my copy of ZBrush 4 so I'm going to start referring to some of the new features and brushes available. One of the best updates is the addition of the Clay Build-up brush which behaves like the Clay Tubes brush but has a nice building effect that feels really natural. It's great for blocking in shapes as well as doing some refining work. Another brush that's good fun to use and is quite helpful with the nooks and crannies is the Move Topological brush. This one basically respects the topology of your mesh and doesn't affect surrounding areas when you are moving things around. For instance, you can move the upper eyelids and not affect the lower ones.



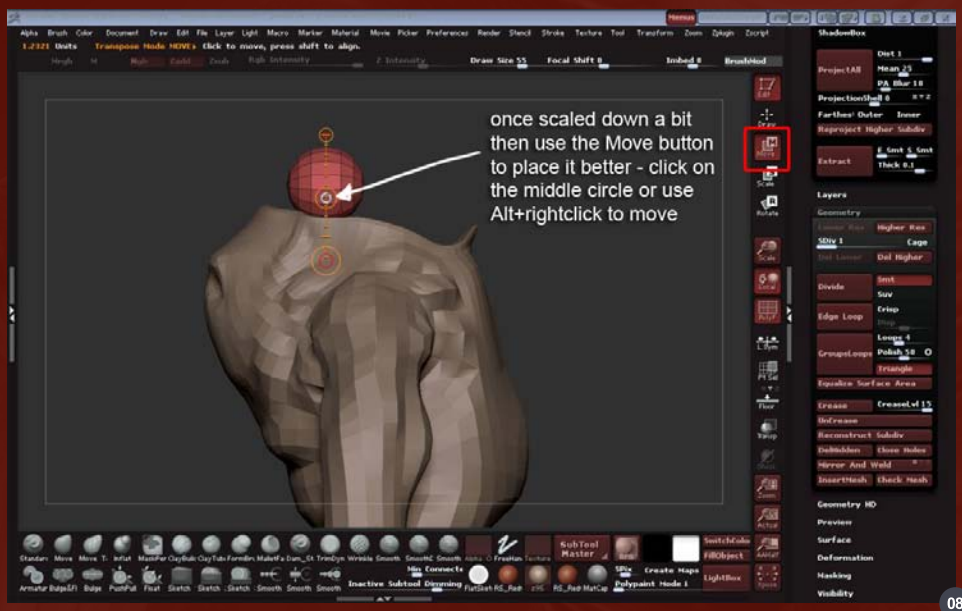
06

Back to the sculpt! Once we get some good masses placed on the body, let's define the

facial features so we can further find the character within. To do this, first we need some eyeballs that we can work around (**Fig.04 – 11**). In the Subtool tab, simply click on the Append button and add a Polysphere to the subtool list. Now we can use the Move, Rotate and Scale buttons to place the sphere on the face. Then use the Subtool Master plugin to generate a quick mirrored eyeball. Next work with the Clay Build-up brush to build up some brows and some simple lips and little nose without getting really detailed. I like to stay on lower subdivision levels until I completely fill them out and can no longer add anything without moving higher. These keep my process honest, forcing me to



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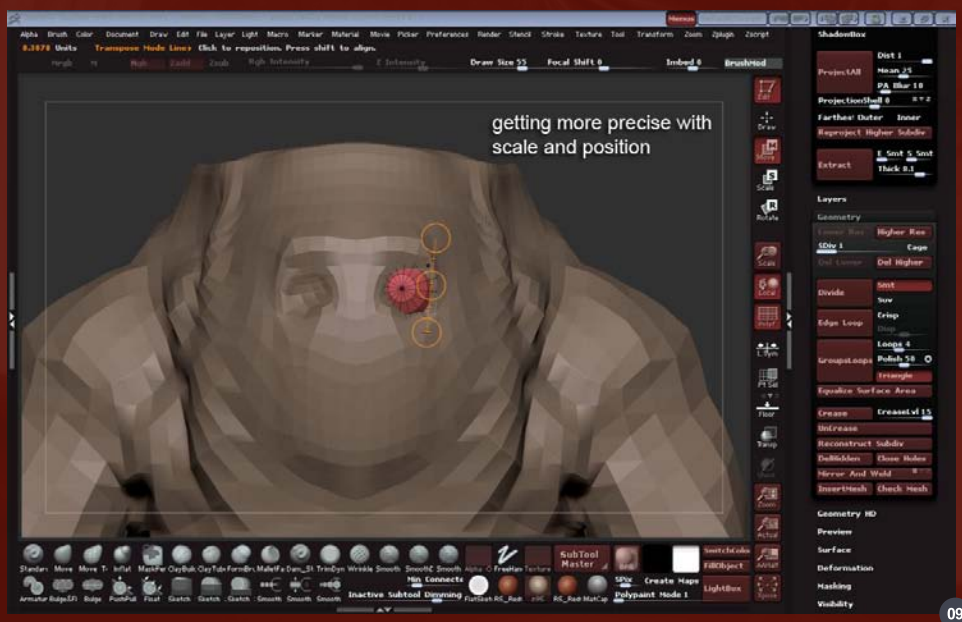
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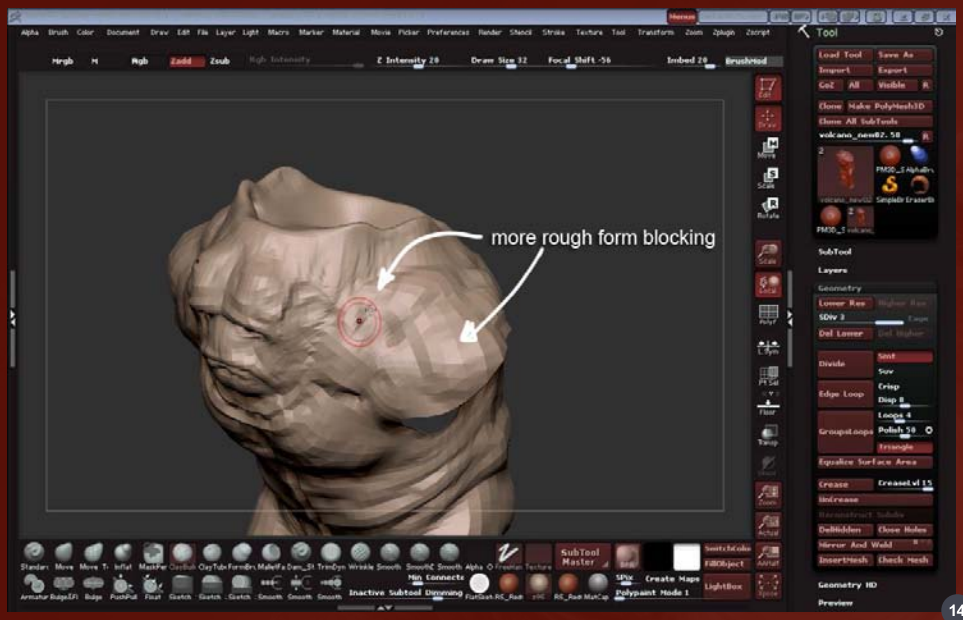
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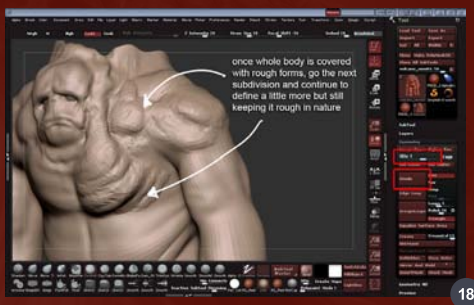
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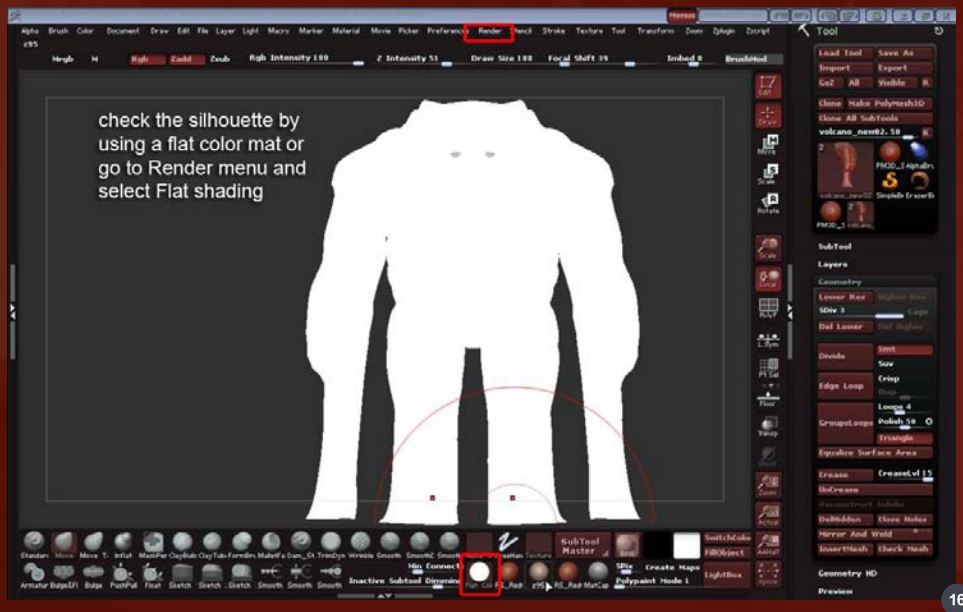
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think about the basic principles and not jump ahead to detailing anything too soon. It also helps the mesh not to look really lumpy and it's easier to control when you build it up this way (**Fig.12 – 22**).

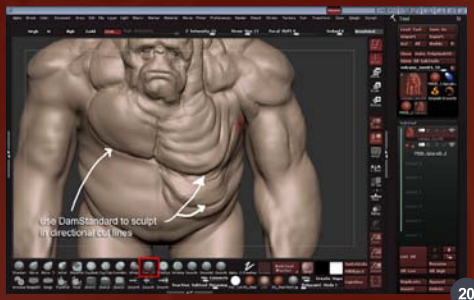
Also it should be noted that I'm placing masses



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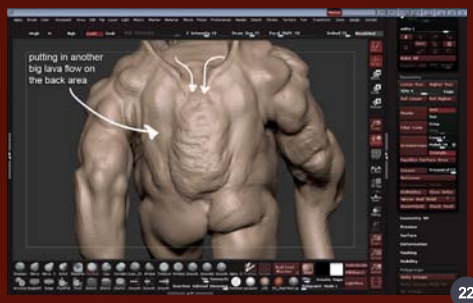
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of forms where I think it will be good to have some rocky forms and lava flow, but at the same time subconsciously thinking about where his "muscles" might go. I think this might help him to look like he could move and not just be a pile of random rocky rubble (**Fig.23 – 29**).



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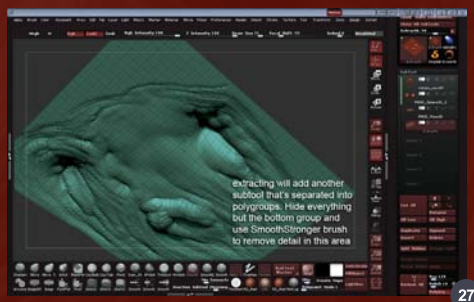


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Now that we have some sort of recognizable character, move on up to a higher sub-d level and begin to do a second pass on the rough blocking. In this phase, keep using that Clay Build-up combined with the Move brushes, and give further design to the blocky forms that are all over. Inherently, when you move up the sub-d levels, you'll find a lot of your work smoothed over so you have to do some clean-up on the rough blocking so it still makes sense. Refining will come next and that involves a little more detail and thought.

So now we need to really focus on identifying the design masses. What do his arms really look like? How is this lava going to actually flow out of the crater? Should his face be symmetrical? When creating any sculpt, these are the kinds of questions I ask myself as I go along.

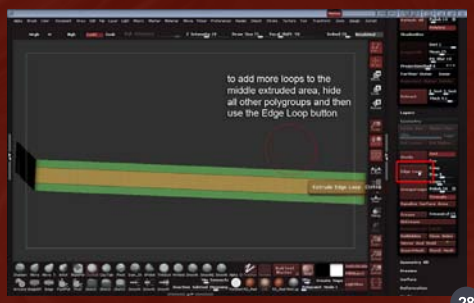
Since his forms are pretty much worked out now, I think it would be best to pose him since we're approaching this as purely a conceptual/ sculptural model and not a production-ready animated character. As a thousand and one tutorials have said before, use the Move (W), Scale (E), and Rotate (R) controls along with some simple masking to strike a pose. Give him a trudging walk with emphasis on his weight and size (**Fig.30 – 34**).



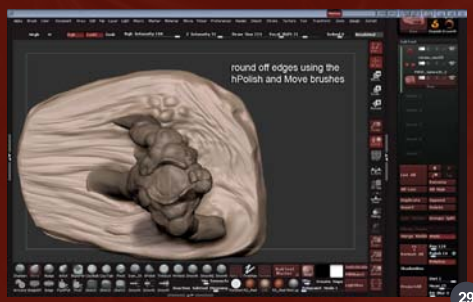
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When I pose my characters I really try to identify an action line and find some sort of appealing silhouette. It really helps me to not only look at the character's shape, but also the negative space (the open space surrounding his form).

Once the pose is sorted, we can confidently move on with further definition. With our



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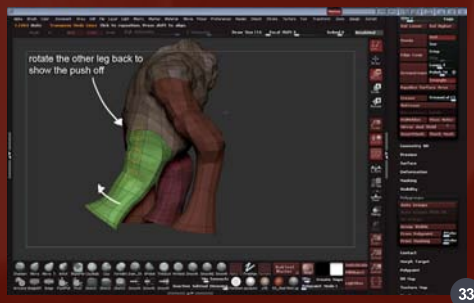
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forms taking a little more life, bring the Dam Standard brush into the mix and use it to punch in crevices and to help form out the transition areas and lava flows (**Fig.35 – 39**).

It helps to make sure you've got decent positive and negative relief on the surface, especially when dealing with the textural effects that volcanoes can create. To finish the roughing phase, methodically cover the entire surface of the character to be sure that every area has been addressed with some sort of design. From here, we can move on to the refining phase and add secondary forms.

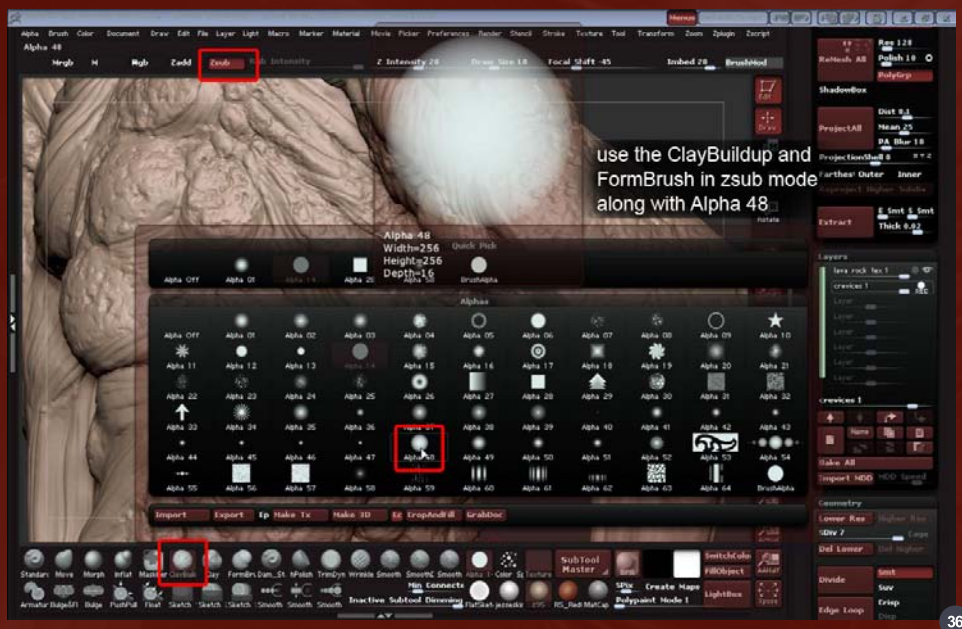


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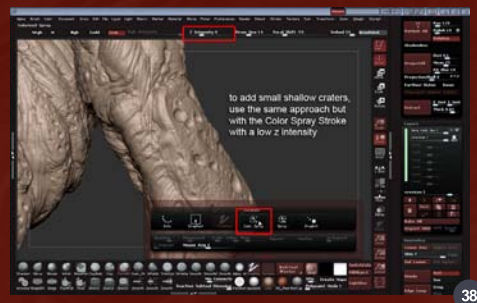
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Using the Clay Build-up and Dam Standard brushes, begin to focus on creating the lava flow details and transition areas (**Fig.40 – 48**). There should be some sort of indication of flow along the sides of the rock that the lava pushes through. We want to focus on creating this all over the surface of the character. Also use the hPolish brush to do give the soft blobs of rocks some sort of hard surface and a somewhat multi-faceted feel. Basically we're trying to avoid perfectly smooth areas because that would make the sculpt look unfinished. The only smooth areas will be where the rock surfaces are melting into the base, for example, the legs and hand transitions. I think those areas should look as though gravity has really taken hold and he's trudging along dragging his gooey self. This way he looks like he's in a constant state of going from a cool hardened rock surface to smooth molten lava.

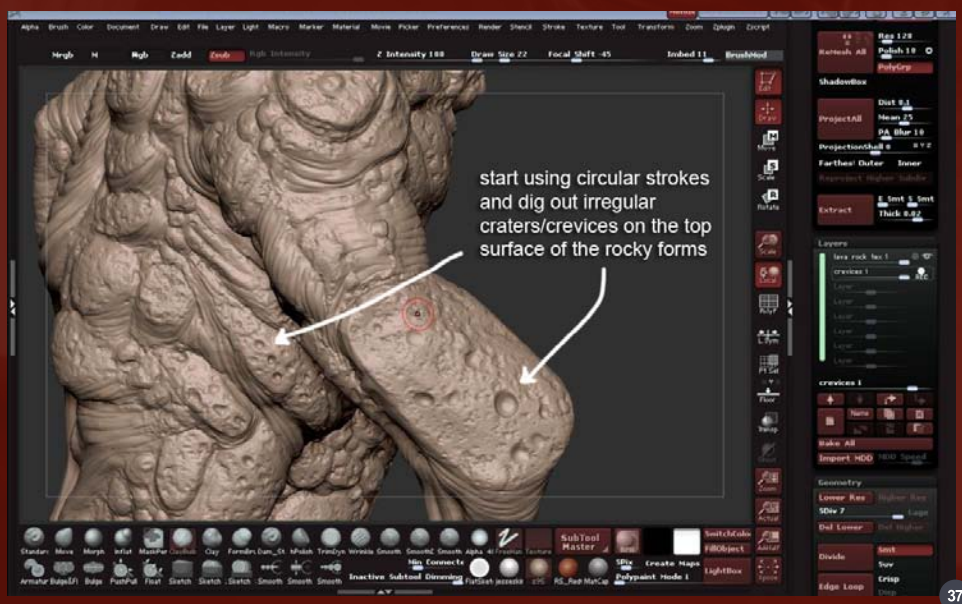


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It's important to note also that the lava flow has a look that indicates layers and thickness. If this



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stuff wasn't viscous, then it wouldn't be nearly as layered. So even though this effect takes a bit of time to sculpt in over the entire character, I believe it's what really sets it apart as a volcano monster.

Like me you might find that you can't really subdivide the mesh another level, and certain parts of the model probably won't handle detail very well. You may not have enough resolution in his hands and the lava flowing from them. So to remedy this without having to do any kind of external retopologizing, we can just add some edge loops using the Edge Loop button under the Geometry tab (**Fig.49 – 52**).

To use this feature, we need to go down to the base level and hide all the faces but the ones where we want to add edge loops. Once hidden, click on Edge Loop and it will add two loops to my mesh. Then we can unhide the rest of the character and finish out detailing that area at the higher subdivision levels. It's not quite an even spread of polygons at the lower levels but it works for what we need it to do, which is being able to have better quality detailing in this area.

To start the detailed surface texture for the craters and rocky feel, we're going to use the Surface Noise feature as opposed to dragging alphas all over the character (**Fig.53 – 59**).

Go to the highest subdivision level, store that as a Morph Target, go back up to the Layer tab, create a new layer and name it, and then finally open up the Surface tab to use the Noise feature. Click on the Noise button and open up the curve palette so you can change the profile of the noise. Remember, until you click on Apply to Mesh then this is just a preview of the noise that you don't have to commit to.

This lets us try out different strengths, scale, and curves so we achieve the kind of noise we want. Since we want something kind of rocky, we need to adjust all three values.



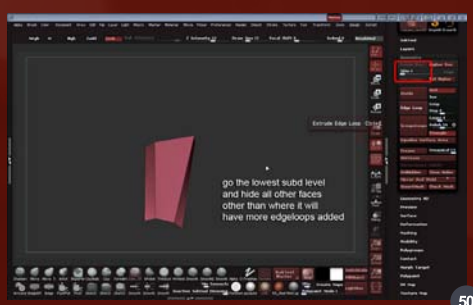
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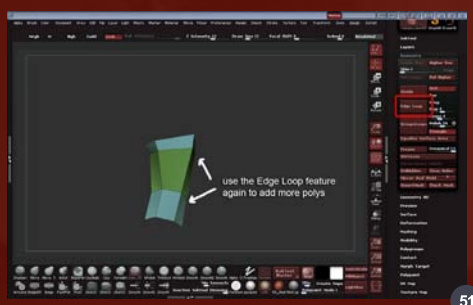
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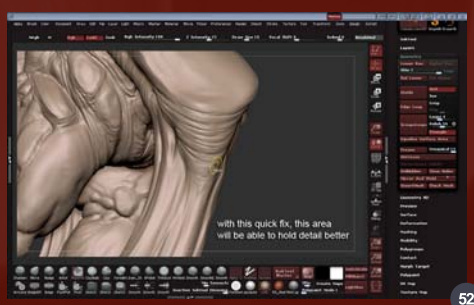
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After experimenting with different curves, I've found that if we put in a dip in the middle it helps to make some interesting craters. Then adjust the scale to around 30 and the strength to about -.04. Now is when we can click on Apply to Mesh and it will be baked into the layer we've created.

You can now turn off this layer to remove the noise and adjust its intensity slider if you want further control. The problem is that the noise is covering every area of the volcano monster. We need to "erase" it out of the smooth lava flow areas. So to do this, use the Morph brush (since we saved out that morph target earlier) and you



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can effectively just remove the noise wherever you make a brush stroke.

Another big textural addition I think we need to make is to add deeper craters and use the bumps in the surface noise we just added as a starting point. Select the Form Brush and Alpha 48 and just randomly add these recesses all over the rocky surfaces. Use the Form Brush because it tends to not smooth out the existing detail as much when adding the strokes. Try to make sure that you made differing shapes and sizes but ones that still made sense for typical lava rock craters. Then after you're happy with the craters, use the same brush and alpha but

use the colorized spray application and lightly go over all the rocky areas again to add another level of roughness. Then finally, add another layer of noise on another layer that will cover the entire surface (**Fig.60 – 62**).

I made this noise to add a small level of texture to all the smooth lava flow areas. To close out the sculpt of the character, make sure that you've got everything tied together and all the surface transitions make sense and have a good level of depth and variety.

The base needs a final pass so use the Clay brush and start adding layers of smooth lava rocks. You can also use the hPolish and Clay Build-up brushes to give the border some sort of varying texture and sculptural feel.

Use a Noise brush to quickly lay in some noise across some of the smooth layered rocks so nothing is perfectly smooth.Sculpting uniquely volcano rocky surfaces and smooth lava flows turned out to be quite fun and interesting challenge to take on.

It's a bit tedious to do these kinds of textural effects but with the new brushes available in ZBrush 4 along with the Surface Noise feature, the process can flow quite nicely.



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On a side note, I tackle these kinds of fun characters and more in my character creation training videos, which is a subscription-based service that releases two 60 minute videos a month. You can find more information and pricing at http://www.cgnuggets.com. Thanks everyone! (**Fig.63 – 67**).

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SANDHEZ
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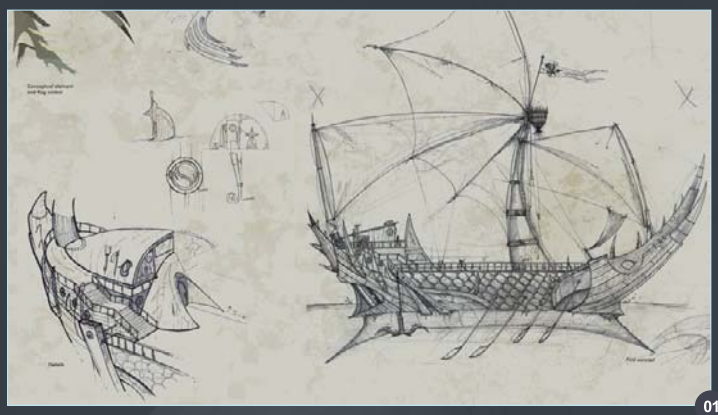
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Making Of Ship

"This image was produced as a personal project. I wanted to challenge myself and use the opportunity to improve my inorganic modeling, texturing and rendering skill and techniques."



Moises Gomes joins us this month and shares the creation process behind his beautiful, sea-faring "Ship", along with some thoughts about the importance of proper planning when starting an image.


01


02

Making of Ship

Software used: 3ds Max, Pro UVLayout, xNormal, Photoshop and V-Ray

Introduction

Hello, my name is Moises Gomes and in this article I will talk a little about the production process for this image.

This image was produced as a personal project. I wanted to challenge myself and use the opportunity to improve my inorganic modeling, texturing and rendering skill and techniques.

Before starting I would like to thank and give due credit to artist David Carvalho, who worked with me on the concept of the ship, and to my friend and artist, Estevão Teuber, for the assembly and integration of photographs.

I will cover the whole process from beginning to end.

Concept

The idea was to create a ship that was in sailing in turbulent weather. After some sketches and drawings I decided on this design (**Fig.01 – 02**).

Modeling

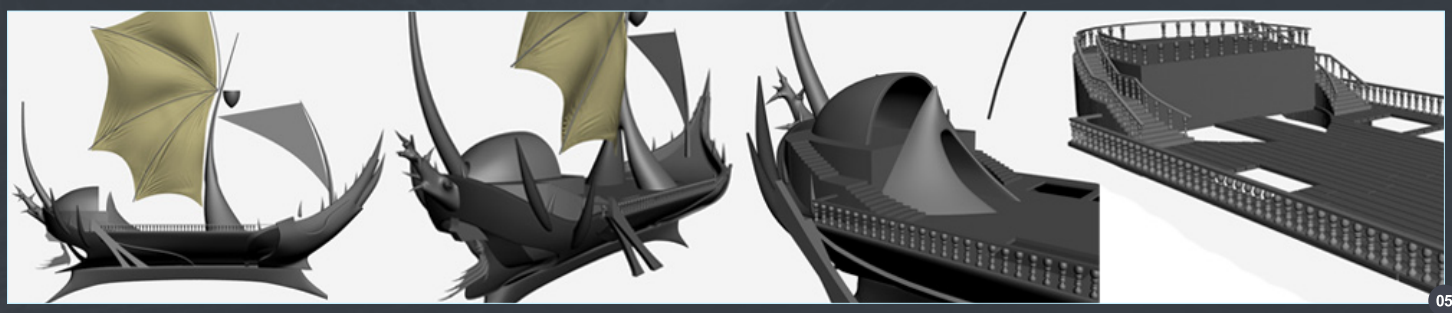
The next challenge was the modeling. This model was very complex to do, because despite being an inorganic object it still had to look very functional. The following images show the modeling process (**Fig.03 – 04**).

To begin with I started concentrating on the main forms and general structure of the vessel.

This is a very important process as it is necessary to make sure all of the proportions are correct (**Fig.05 – 06**).


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After I had worked on the main form and shape, I moved onto the detailed modeling and started to add all of the features (**Fig.07 – 08**).

At this point the modeling was almost complete. During the process I made a few changes in the layout and the overall design, and made the front of the ship look more like a monster (**Fig.09**).

These images show some of the changes that I made (**Fig.10**).

Here is the final result (**Fig.11**).

Texturing

The texturing of this ship was the most time-consuming part of the whole process; this was due to the fact that there were a lot of different materials involved.

The ship needed to look like it had been well used and have an overall rustic look to show that it had been to many different places in many differing situations. With this in mind nothing could look clean or new. To achieve this look I used Photoshop.

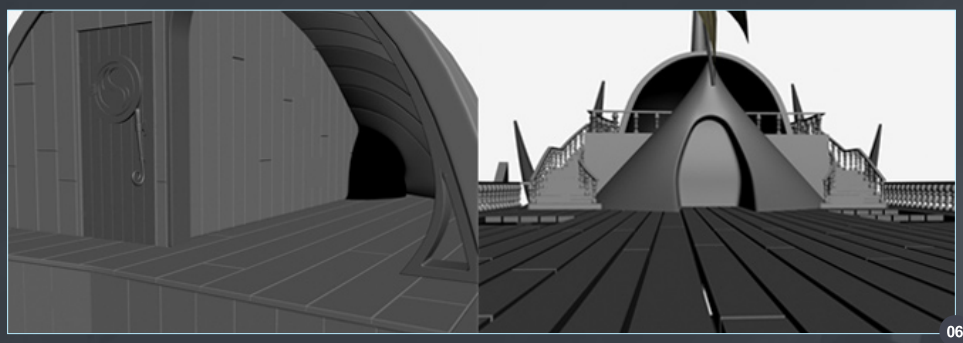
I used V-Ray as the render as I find it gives a realistic look without having to battle with too many complex configurations. The following images show the textured areas and parts of the texture itself (**Fig.12 – 14**).

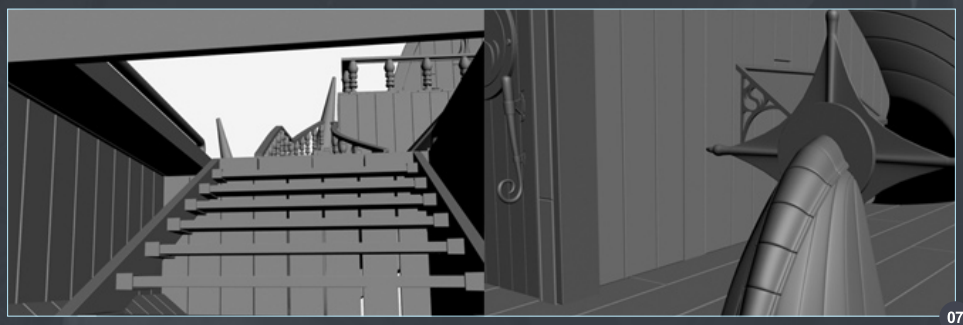
At this point the hull was almost finished, but there was still a lot to do. So far I had used 6GB of texturing maps! (**Fig.15 – 16**).

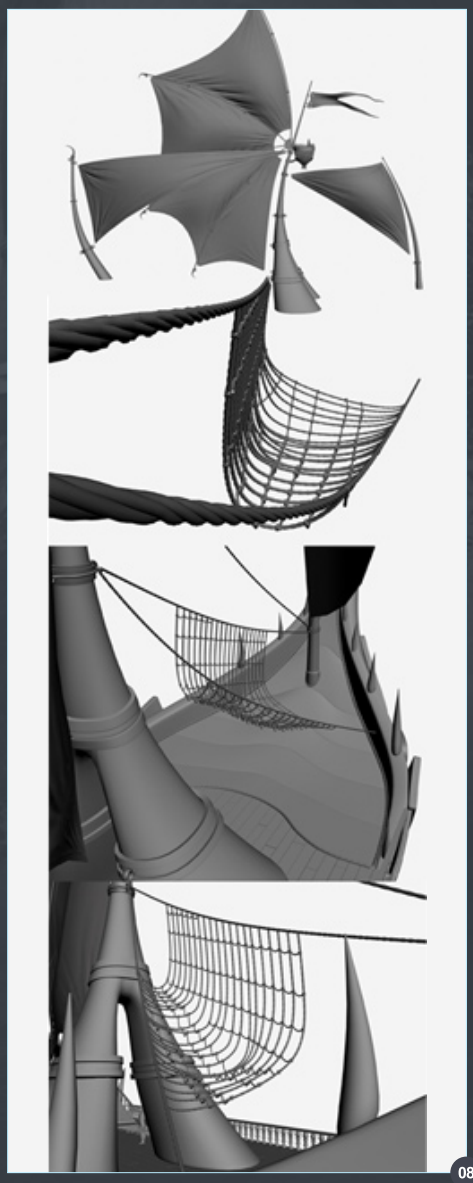
I set the parameters of the shader to achieve the best result for the entrance of the cabin.

For all of the textures I used diffuse, specular, bump, displacement (when necessary) and reflection maps (**Fig.17**).

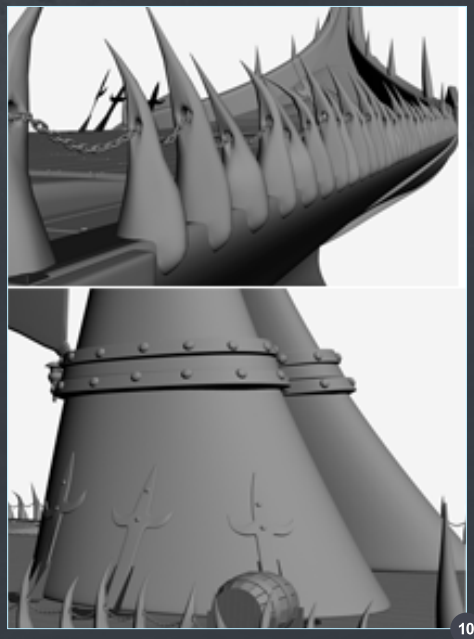
Here is the final model with the textures (**Fig.18**).


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Render

To render the boat was actually a very simple process. I find that V-Ray offers the best results with the fewest parameters and settings. To finish the image I took it into Photoshop for post-production.

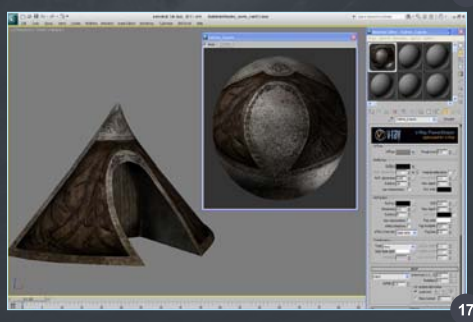
My main focus when rendering was to make sure that none of the shadows were too harsh so that they could be adjusted in Photoshop and integrated with photos.

I used a V-Ray plane to assist the final render, and the V-Ray physical camera (**Fig.19 – 23**).

Here is the final result using the material settings shown in the previous images (**Fig.24**).

I always do my renders a little darker and with


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a more uniform color with no burst point. This makes it much easier to make changes to color and to adjust the lighting.

Composition

After configuring and testing the lights and materials to get a result that looked good, the next step was to render the separate elements and to begin assembling the final 3D image.
I rendered Z-depth, diffuse, Specular, Occlusion, and Alpha Wire maps (**Fig.25**).

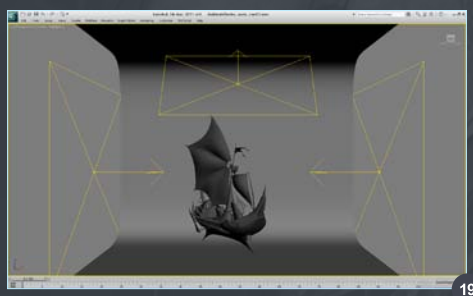
This is the result after the first tweaks (**Fig.26**).

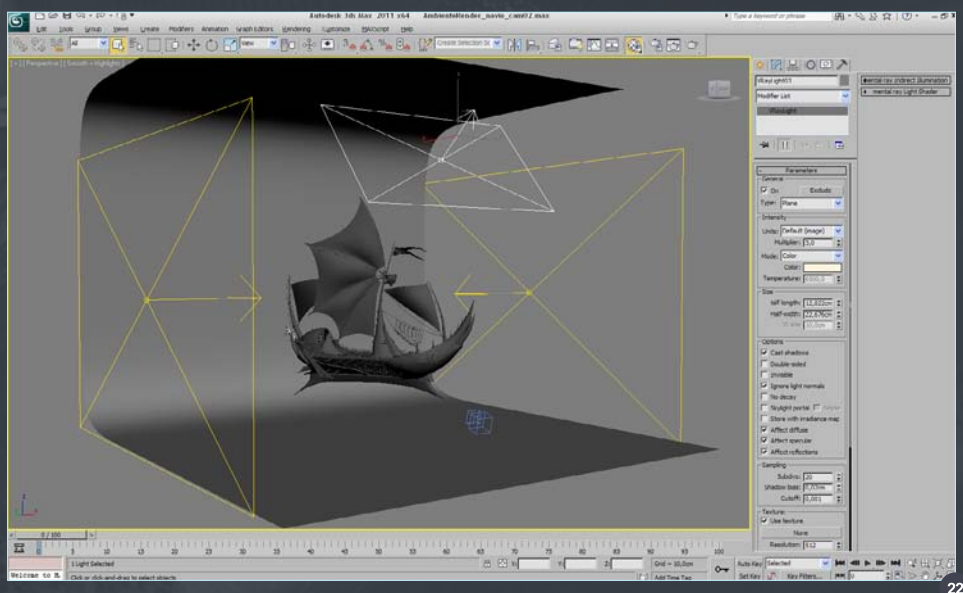
Final Image - Part One -Planning

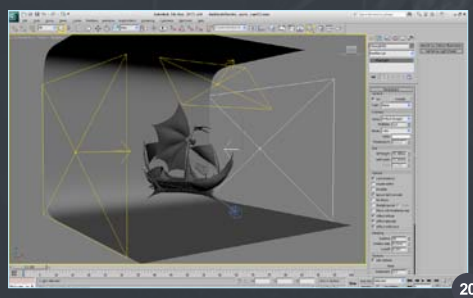
Without a doubt, the most important part in a process that involves creation is the planning. It is vital in all art forms, even traditional.

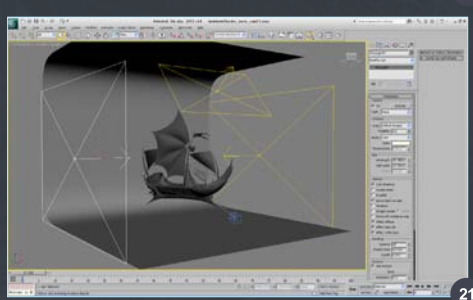
The image was put in Photoshop and a few strokes were added to start the process of moving towards the final image (**Fig.27**).

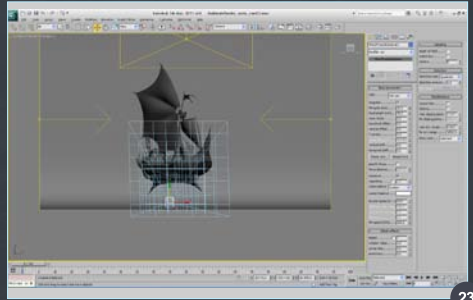

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I then used the Dodge tool to adjust the highlights (**Fig.28**).

With my idea for the final image created, I started on the final version. It is important to split the layers into separate elements. In this case the layers were split into the boat, sea, sky and foam.

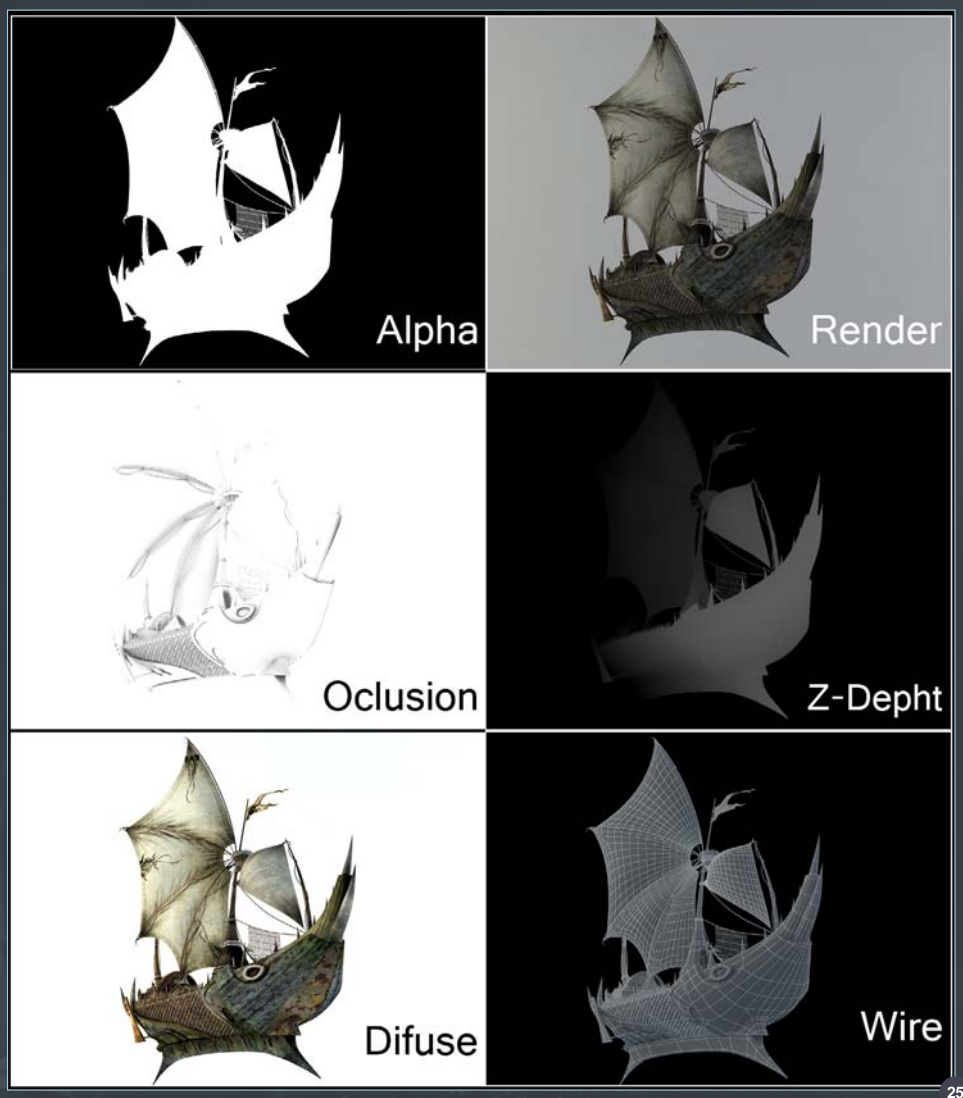
Too many layers can cause things to become a bit disorganized (**Fig.29**).

The size of the focal object in the scene is important. There is a simple rule that you can use to ensure you get this right: the focal object should fill about 70% of the space on the canvas (**Fig.30**).

You can make changes at this point such as a camera distortion effect. This is done by using the Warp tool in transform mode and adds movement to the image. The shape of the ship indicate a sharp upwards movement (**Fig.31**).

Choice Of Elements

When you have decided on the final direction of your image you can collect some images that



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you will incorporate into the scene. Preferably these should be high resolution, but if the images only feature a small amount in your image then there is no need to make them large.

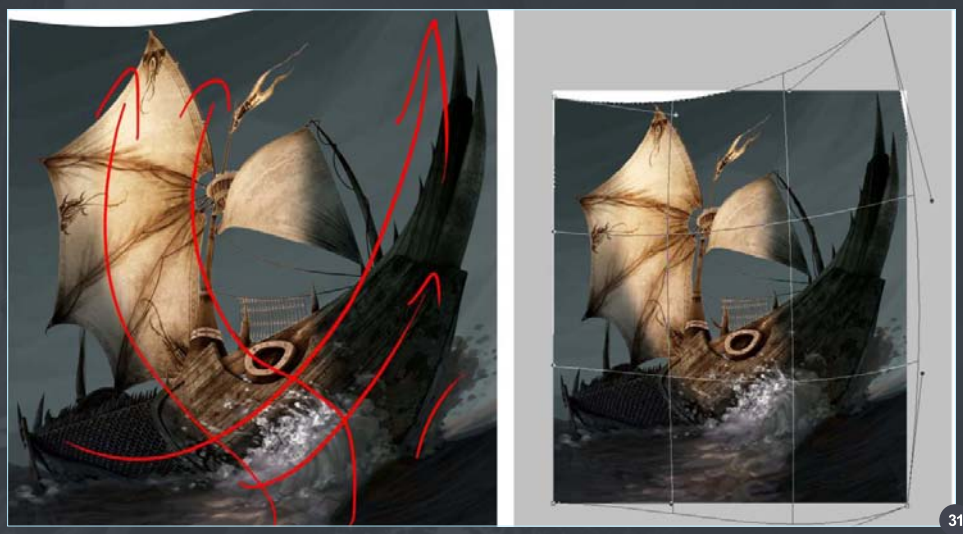
Placement Of Elements

Before you start adding images the image size should be very high.

The background colors are important as they set the tone for the image (**Fig.32**).

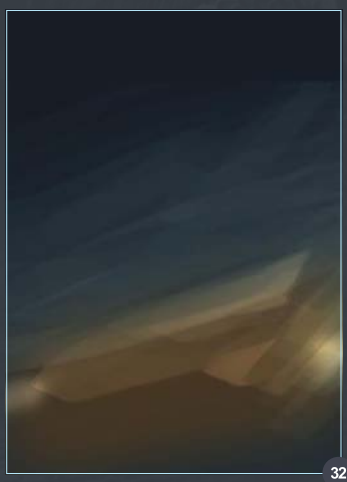
The photographs were added from the bottom up. Use the Warp tool to adjust these (**Fig.33 - 34**).

I added the boat in high resolution and applied highlights to it using the Lasso tool with feathering (**Fig.35**).


31

The reflections were added with brush strokes. I adjusted the color highlights towards yellow. This is to make it look as if the light is reflecting off the sea (**Fig.36 - 37**).

I used the feather tie set between 40% and 60% on the opposite side of the boat and curves to create the bounce lights (**Fig.38**).


32


33


34


35

I selected areas where the shadow was strongest and moved the color balance towards midtones, pulling out the blue (**Fig.39-40**).

To do the foam I took the foam images from my references and applied them using the Clone Stamp tool to blend them in.

I continued using the Lasso tool and applying curves to adjust each area (**Fig.41**).

It is important to pay specific attention to areas of contrast. Even during the planning process it was easy to see areas where the contrast would be strongest.

I made sure there was a lot of contrast between the front of the ship and the sky behind, and the same applies to the sail area (**Fig.42**.

Final Adjustments

I equalized the colors using Hue and Saturation. In this case I decreased Saturation to my taste.

After flattening the image I also used a Noise filter to finish the image. This is the final result (**Fig.43**).

Conclusion

I hope that this Making Of has been helpful. If you have any questions then please don't hesitate to get in touch with me.

Moises Gomes

For more from this artist visit:
http://moisesgoms.blogspot.com
Or contact them at:
moisesgoms@hotmail.com



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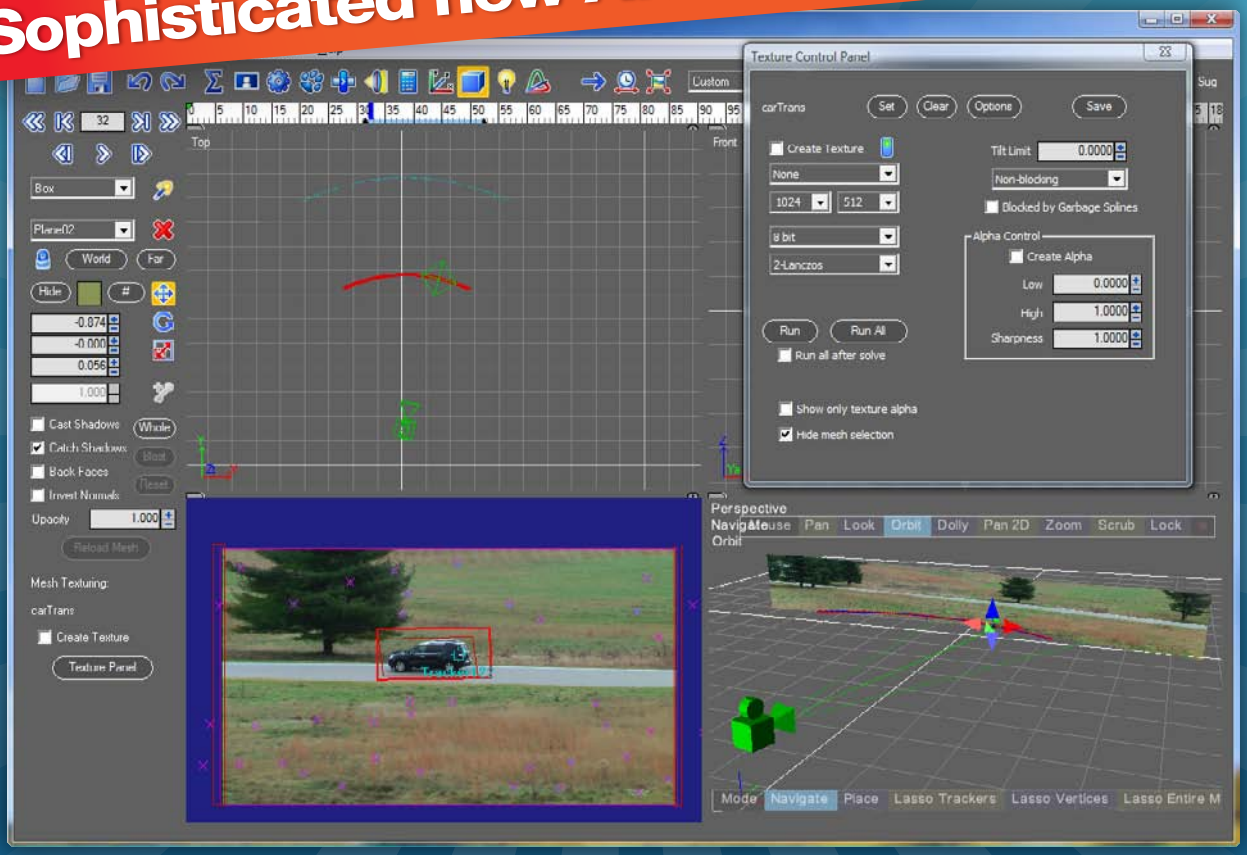

42



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Digital Art Masters
Volume 5





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This is more than just an artwork book. Not only does it feature full-colour, full-page images, but each artist has given a detailed description, in their own words, of the creation process behind each piece of published artwork. And they've done it especially for this book!

This month we feature:

"Octopus's Diner"

by Stephan Brisson

The following shots of the “Octopus’s Diner” book pages are featured here in full-resolution and can be read by zooming in...



Octopus's Diner

By Stéphan Brisson, Valérie Villeuneuve, Elise Frappier

Job Title: CG artist – RodeoFx Montreal | 3D Artist – Hybrides Technologies | Illustrator – Meduzarts / Alpha-Vision

Software Used: Maya, Mental Ray, Photoshop



Introduction

This personal project was done at Meduzarts Digital Environment Studio by Stéphan Brisson, Valérie Villeneuve and Elise Frappier. Stephan combines formation in architecture, cinema and 3D animation. He has worked in an architectural pre-visualization studio for eight years, first as 3D artist, then as project leader. He's now working in the film industry. Valerie Villeneuve has completed training in interior design and holds a bechelor's degree in Film Animation from Concordia University in Montreal. She has worked as a 3D digital artist and, later on, as a project leader. Elise Frappier has been doing illustration for the past seven years, works as a matte painter and texture artist, and graduated in Illustration & Design from Dawson College.









Concept

The initial idea behind our image was to portray the effect of global warming on day-to-day life. It was intended to be humorous, and to show how life could gradually change if we were suddenly confronted with the melting of the poles to the point where we had to live under the sea. We imagined how people would gradually adapt their lifestyles, creating new tools and houses with what was available around them, showing that humankind is foolish enough to destroy its own environment but is also intelligent enough to adapt to any circumstances.

All three of us put our heads together to come up with the concept and sketched out all kinds of ideas to make it work. Stéphan and Valerie modeled, textured, shaded and lit the scene, and Elise worked on the textures and matte painting.

We began by brainstorming about the look and the setting of our scene. We did not wish to portray a recognizable time or place, so we went with a timeless setting: a retro diner. We tried to imagine how people living under the sea would dress, eat and live. We conceptualized a lot of accessories such as the mechanical octopus waiter, which we derived from an actual early submarine design. You may notice some steampunk influences – we thought the style would visually express this chaotic existence well.

The first step of modeling was a quick layout of the restaurant. This helped us to figure out where to place the camera. Once we were agreed on the composition, we started to model the various elements in high resolution (**Fig.01**).



We then textured and designed each element as it would appear in a diner, only much more damaged by its underwater setting. We didn't spare any detail; from the stainless backsplash to the old cash machine, the vintage clock, the red vinyl stools and milkshake glasses, we stayed true to a typical retro feel.

A little tip along the way: when you plan to have a blue atmosphere, don't correct your textures in blue, but rather add blue in post-production. You will get a more accurate result and save a lot of time and trouble (**Fig.02a – c**).

The challenge with the lighting was to combine a restaurant's normal lighting with the very peculiar glow of an underwater setting. To make sure we had as much control as possible, we rendered all the lights on a different pass and then adjust the intensity of each one in Photoshop. For the fog effect, we used a technique that simulates a room full of dust. Thus, we could adjust the fog globally in the scene instead of adjusting for each light separately.

However, there was still one thing missing to create the impression of a place filled with water: particles. Instead of using 3D tools, we simply shot snowflakes falling from the sky to efficiently reproduce different depths of particles and integrated them into our image. We then blurred the scene further in the background to enhance the sense of depth (**Fig.03**).





For the Photoshop portion, the longest but most important step was to break up the 3D; edges needed to be broken using stamping and painting. We overlaid textures to create more realism, dirt and damage. We also made sure there was low frequency to counteract the high frequency created by the density and noise of the textures. For our final 3D touchups, we painted highlights arbitrarily. Then the background was created, along with sea elements such as fish, algae, clams, bubbles, etc. Adjustments and color corrections were done throughout the entire process to get everything to fit together, to create the appropriate mood and to maintain a color palette that matched our theme (**Fig.04**).

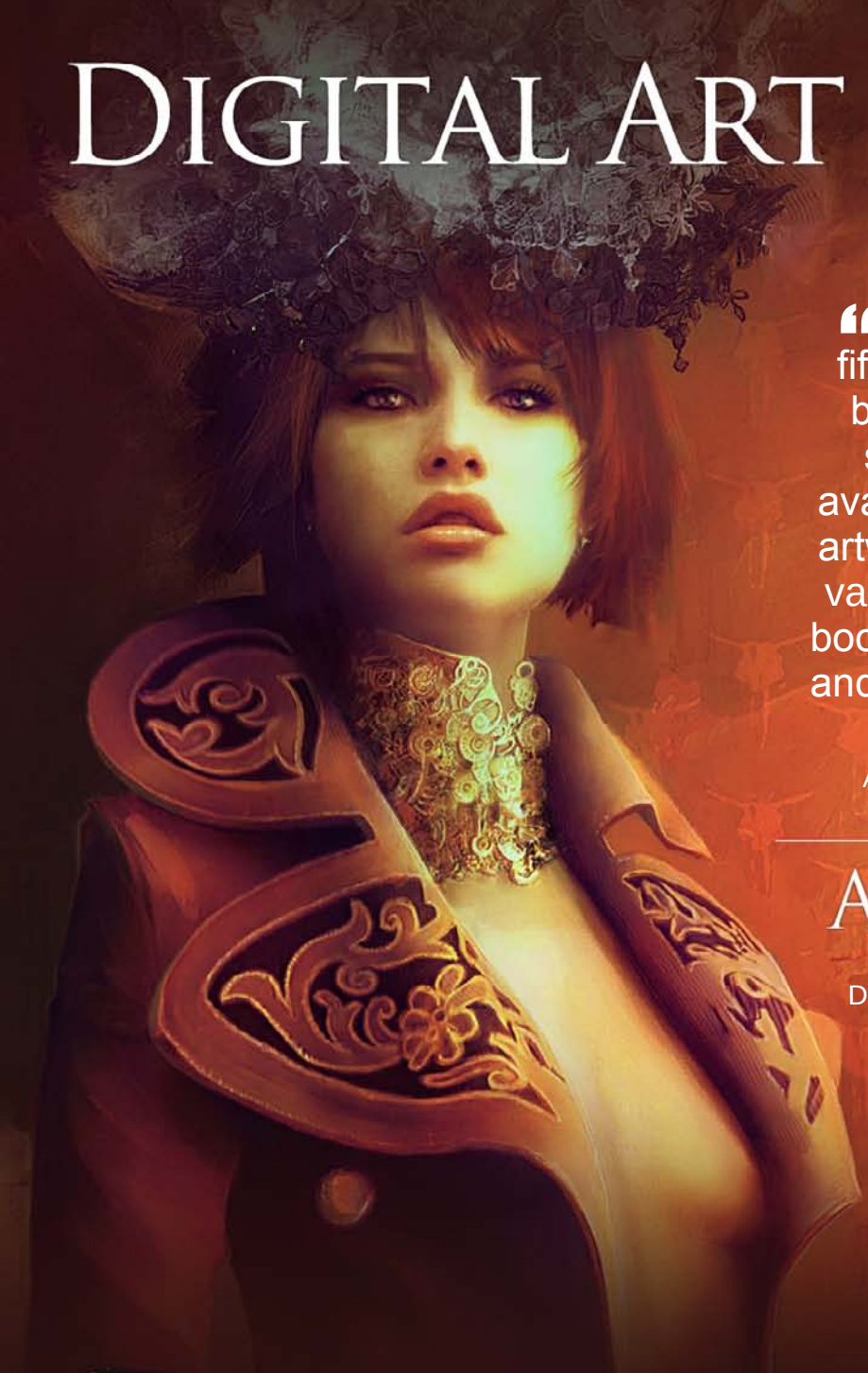
Because we lacked the time required to complete two CG characters of sufficient quality, we took photos of Stéphan in winter gear and made him stand in as our two customers. We integrated the resulting images into the scene by adding CG helmets, painting extra diving gear such as leather straps and diving boots, and distorting the features so that the characters do not look the same (**Fig.05**).

Conclusion

We are very pleased with the quality of the work we achieved and the final image we created. We spent over 150 hours in total on this project, yet none of these were wasted thanks to our management of time and resources (having two team leaders on our project certainly helped!). Spending a little extra time on scheduling and planning ahead certainly saves a lot of headaches down the road. Teamwork was a very enriching and stimulating experience, and helped to keep each of us within the initial timeframe we had set.

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DIGITAL ART MASTERS
:VOLUME 5



"Digital Art Masters is in its fifth edition now, and can easily be considered one of the best showcases of digital artwork available today. The quality of the artworks, the fine printing and the valuable walkthroughs make this book a must-have for any art lover and for any CG artist, professional or beginner."

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Following on from the success of our first four books, we received yet another overwhelming response to our call for submissions for Digital Art Masters: Volume 5. Once again over 1,100 submissions made their way into the Digital Art Masters mailbox, proving to us that the series is becoming ever more popular with not only our readers, but artists around the world too!

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by Djordjie Jovanovic, Luigi Terza & Tamás Gyermán

Photoshop post Effects
Chapter 2 - Sparks+ Glows
by Richard Tilbury

The Italian Courtyard
Unreal Games Engine Tutorial
Chapter 3 - Part 2: Static textures and meshes
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CREATING THE CELERITAS

SPACESHIP MODELING & TEXTURING

3ds max



Chapter 1 | November Issue 063
Concept

Chapter 2 | December 064
Modeling the Low-Poly Version

Chapter 3 | This Issue
Modeling the High-Poly Version

Chapter 4 | February Issue 066
Mapping and Unwrapping

Chapter 5 | March Issue 067
Texturing

Chapter 3 - Modeling the High-Poly Version

In this fascinating tutorial series our artists will be guiding us through the creation of a complete spaceship in a scene, from beginning to end. We begin the series in Photoshop, using some of its excellent features to help create a concept, a vital process for anyone hoping to come up with an original design. That design is then passed on to our team of modelers who cover the stages of low and high poly modeling, texturing and post-production. This series is filled with tips to help during all of the stages leading up to the creation of an amazing sci-fi scene with an original spaceship.

CREATING THE CELERITAS CHAPTER 3 - MODELING THE HIGH-POLY VERSION

Software used: 3ds Max

Before we continue building our ship we need to familiarize ourselves with smoothing geometry in 3ds Max.

Smoothing lets you subdivide the geometry while interpolating the angles of new faces at corners and edges.

The effect of smoothing is to round over corners and edges as if they had been filed or planed smooth. You can smooth geometry in your scene by means of several different methods:

- NURMS Subdivision (Command > Subdivision Surface)
- MeshSmooth modifier
- TurboSmooth modifier

In our example we have a simple object made out of three polygons. The polygons are at 90 degree angles to each other (**Fig.01**).

When we apply NURMS Subdivision the geometry gets interpolated, meaning that every polygon is divided by two on the width and height, resulting in four polygons where there was only one before.

So in our case we now have geometry with 12 polygons, which now have smoother angles (**Fig.1a**). If you do this twice you'll get 48 polygons and even smoother geometry (**Fig.1b**).

Now if you want to smooth your geometry but also want to maintain some harder angles, you just need to add more "resolution", or edges, at the corners you wish to remain sharp.

Using the Connect tool we'll add an extra edge to our geometry and slide it near the corner (**Fig.02 – 02b**).

Fig 01

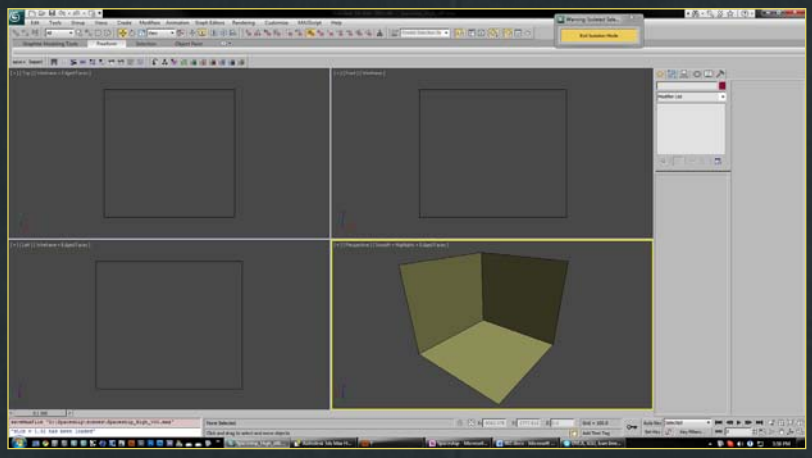


Fig 01a

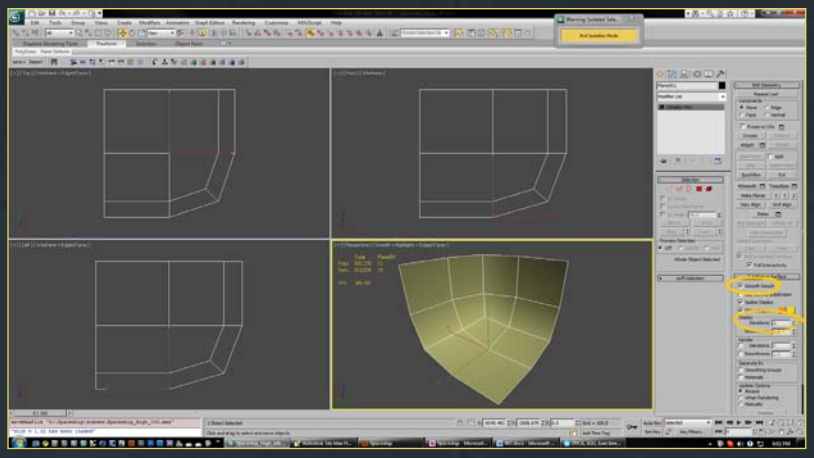


Fig 01b

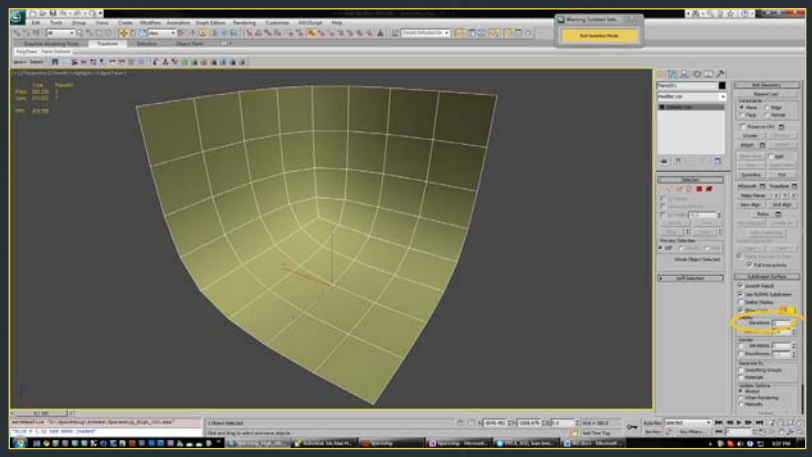
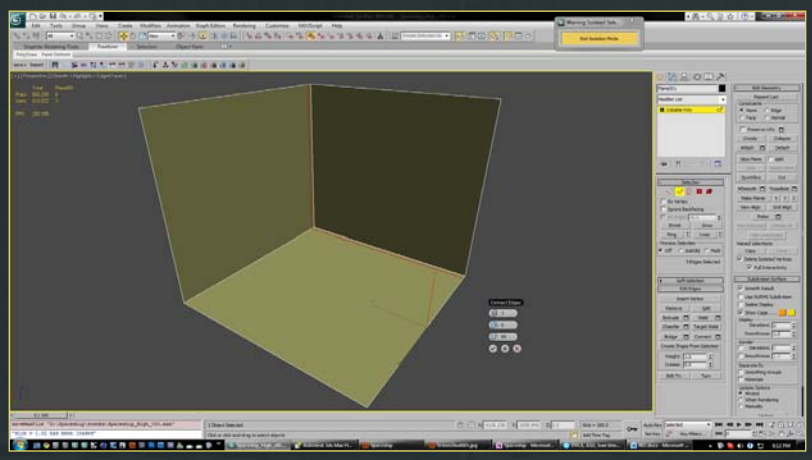


Fig 02



Now when you apply Smoothing you'll see the difference. The sharpness of the angles depends on how close the edge is to the corner (**Fig.02c**).

In general while modeling I like to use NURMS Subdivisions, because I have it assigned to a hotkey which allows me to switch between smoothed and unsmoothed geometry very quickly.

However when I move to rendering, I like to assign the TurboSmooth modifier to all the geometry that needs smoothing. TurboSmooth is considerably faster and more memory-efficient than other smoothing methods.

Understanding how smoothing works is one of the essential skills for modeling, so I strongly recommend playing a bit with geometry and smoothing it until you grasp how the whole concept works.

Let's continue where we left off in the previous chapter. Since modeling is not a linear process, but more of a trial and error and experimental process, I can't take you through a detailed step-by-step in this chapter.

So I'm going to show you every single piece of the ship and explain to you how I got there.

As I mentioned in the previous chapter, you don't have to be too exact when following me. We'll start with the nose of the ship.

First of all I refined the profile shape by tilting the nose slightly downwards, re-adjusting the air intake, and making it a lot bigger (**Fig.03 – 03a**).

Fig 02a

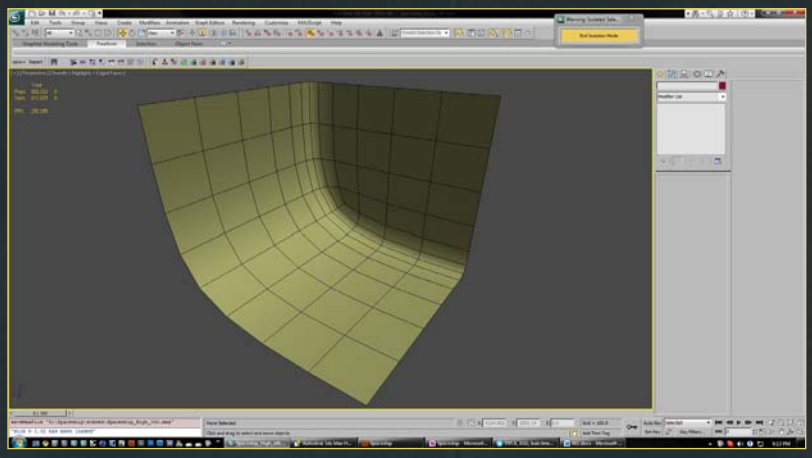


Fig 02b

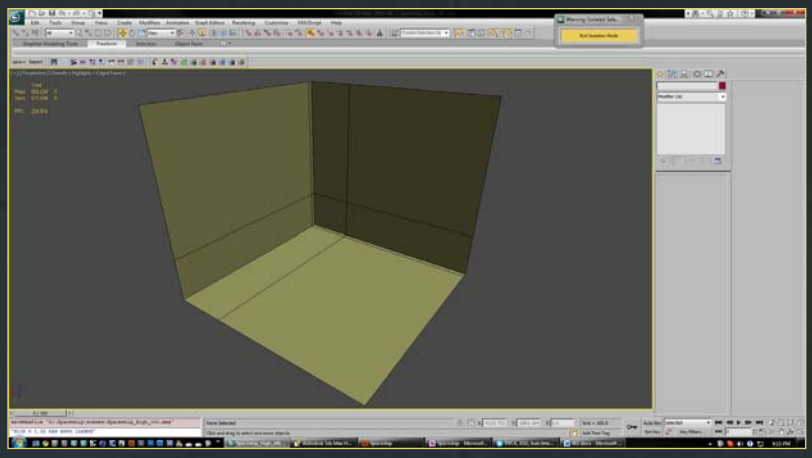


Fig 02c

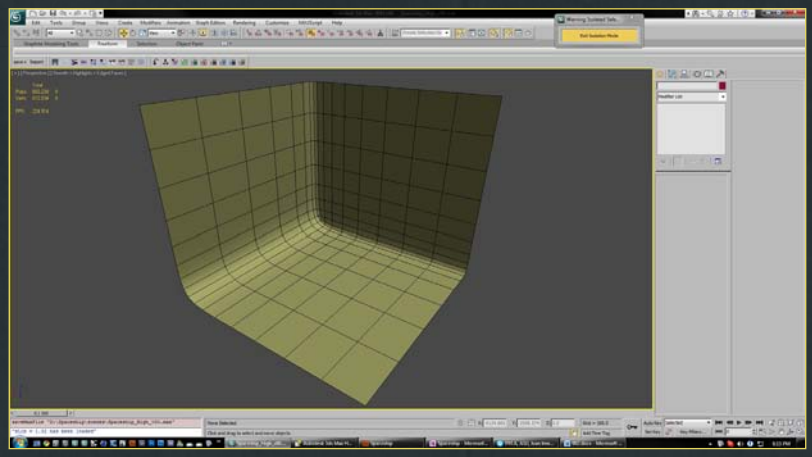
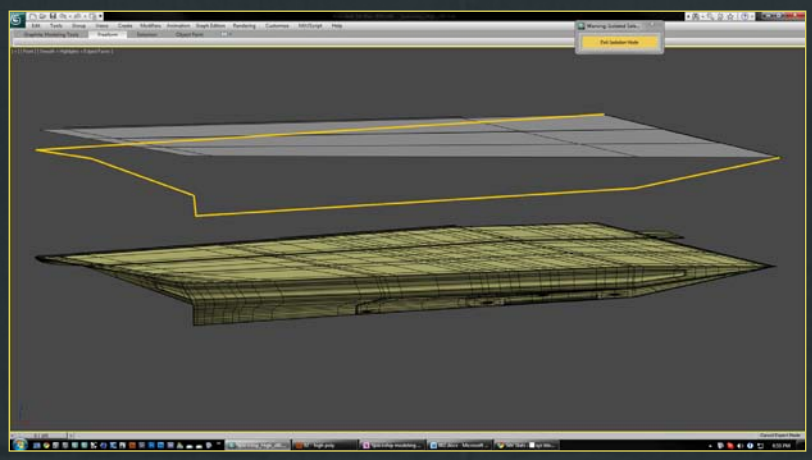


Fig 03



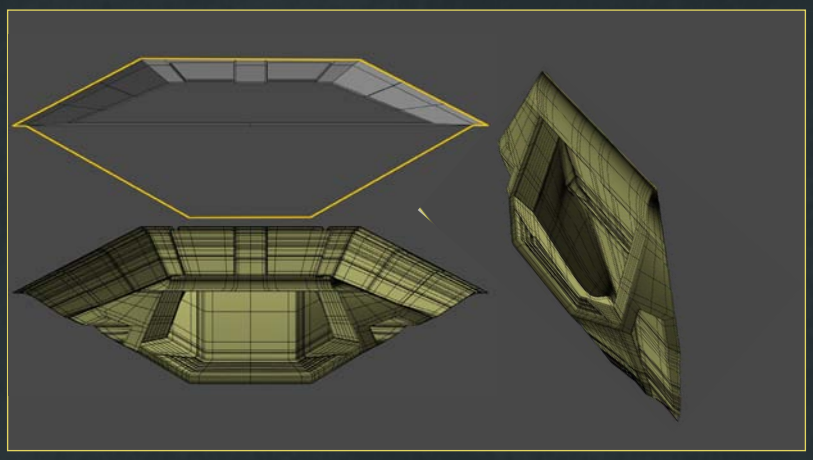


Fig 03a-b

I then built the interior of the intake (**Fig.03b**). All of this was built using edge extrusions, and some connecting, deleting and repositioning of vertices. Play a bit with the shape until you're satisfied with what you've got.

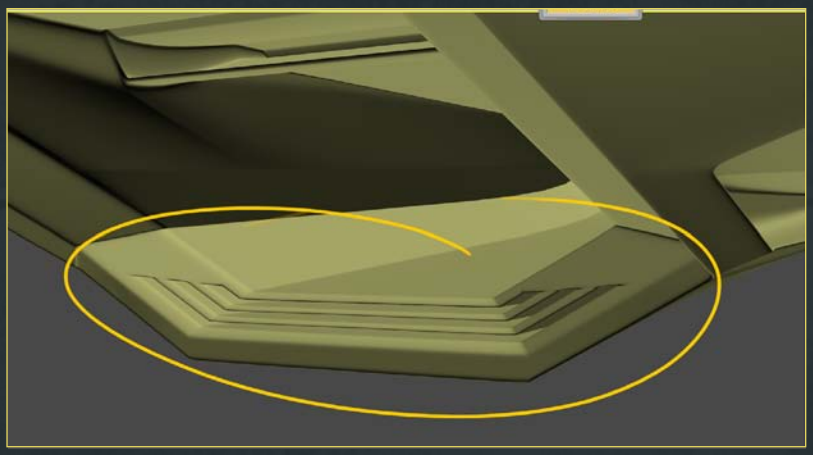


Fig 04

We now move on to adding some details. First, I made some indentations to the front and simply added extra edges for horizontal lines using the Connect tool. Then, using the SwiftLoop tool, I added some extra loops to define the side edges for the indentations. (SwiftLoop is a fast way of adding edge loops to geometry.) Next I selected the polygons I wanted to indent and extruded those inwards. I added an extra, smaller intake inside the main one using the same methods. Using the Inset tool, I defined the outline for the indentations on the side of the nose. Then I simply extruded the polys inward. Using the SwiftLoop, Extrude and Chamfer tools you can add some extra details to the tip of the nose (**Fig.04 – 04f**).

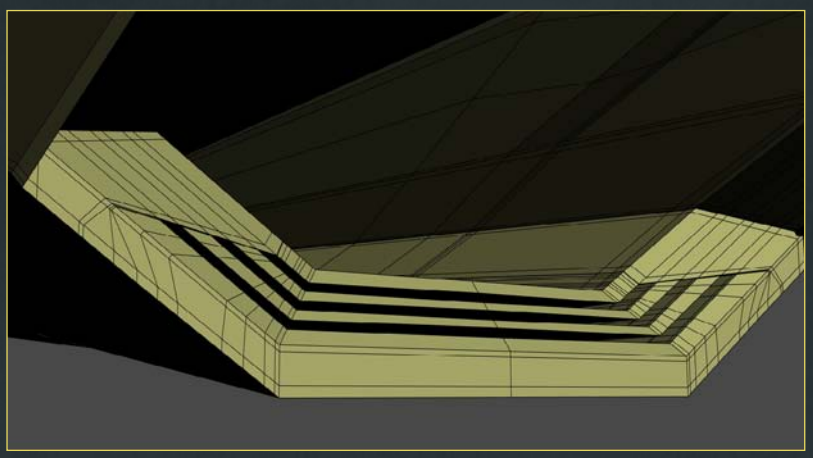


Fig 04a

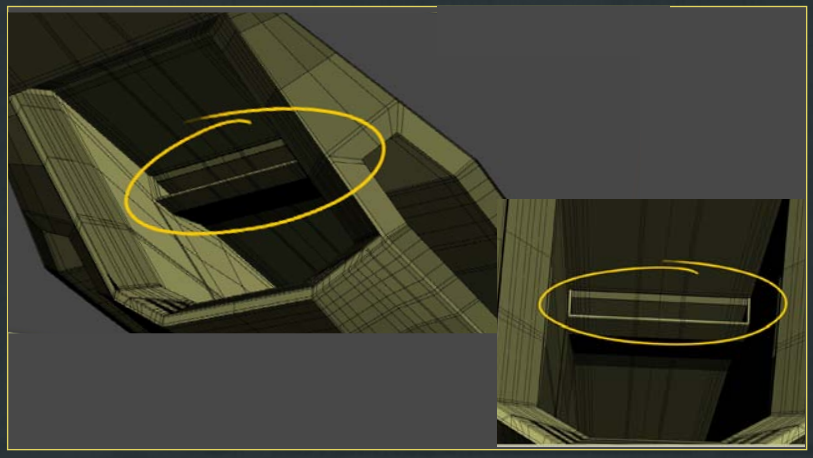


Fig 04b-c

Fig 04d-e

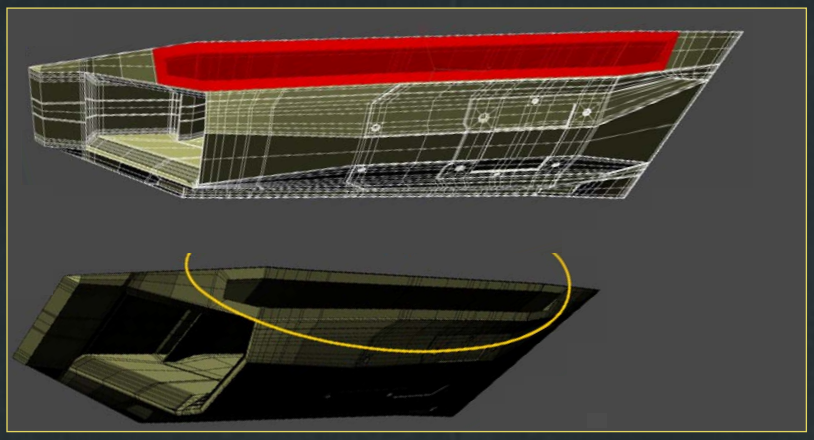
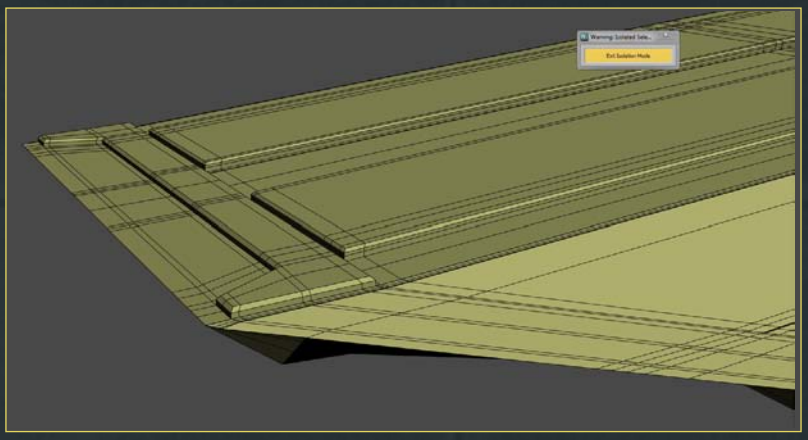


Fig 04f



Using SwiftLoop, Extruding, Cutting and some moving, I added some extra details to the bottom part of the nose. Bear in mind that you can speed up the process by working on one half of the geometry and then just Mirroring the other half. For the end of the nose section you can add a few modified primitives as an extra detail (**Fig.05 – 05e**).

NOTE: By now you should start checking what your geometry looks like when smoothed. So try it out whenever you make some changes to the shapes. Also start adding extra loops where needed to make your geometry nice and sharp.

Fig 05

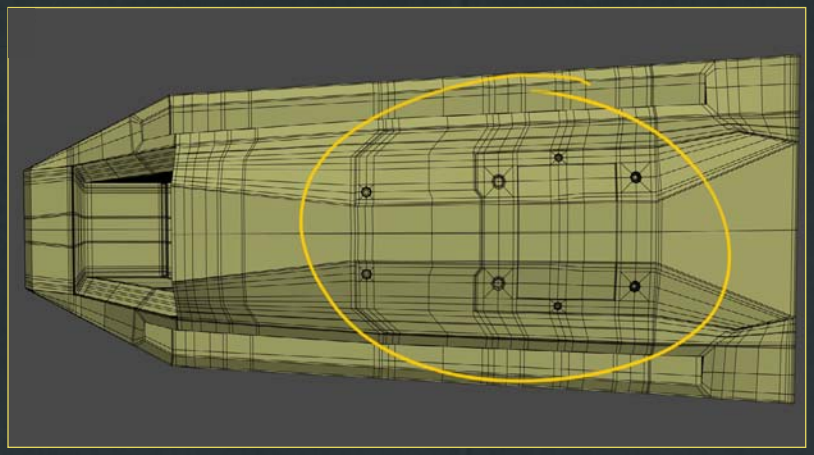
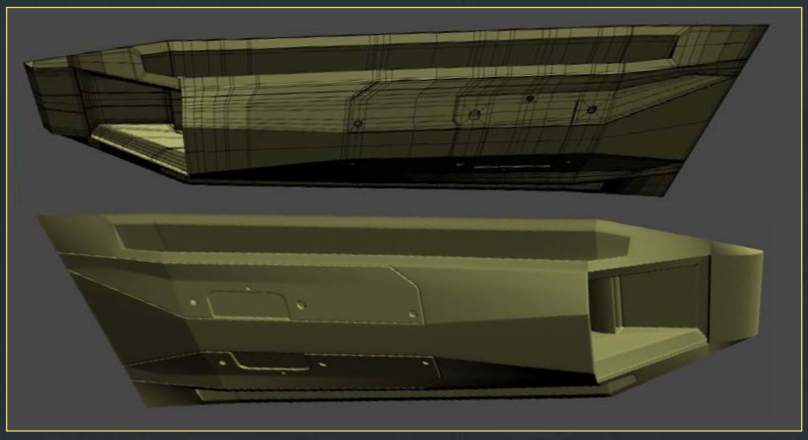


Fig 05a-b



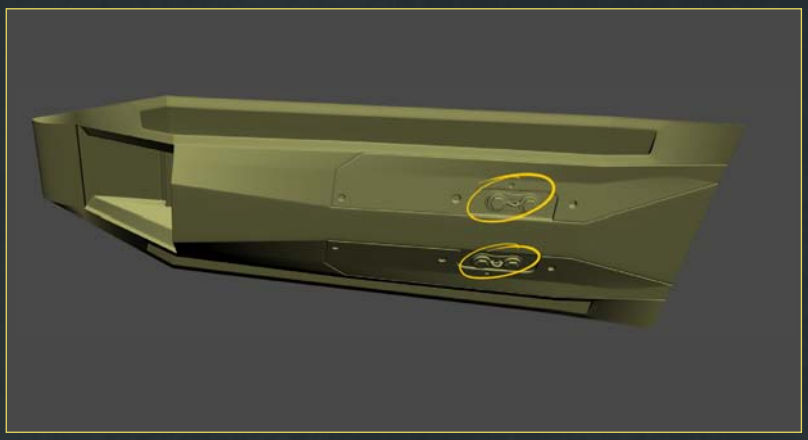


Fig 05c

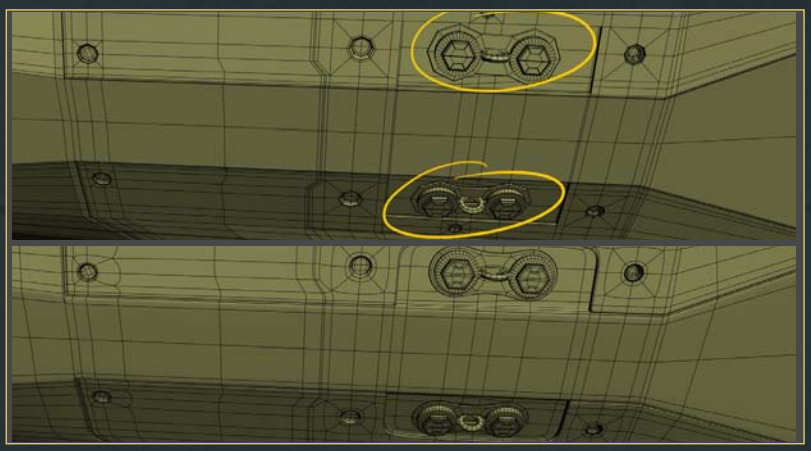


Fig 05d-e

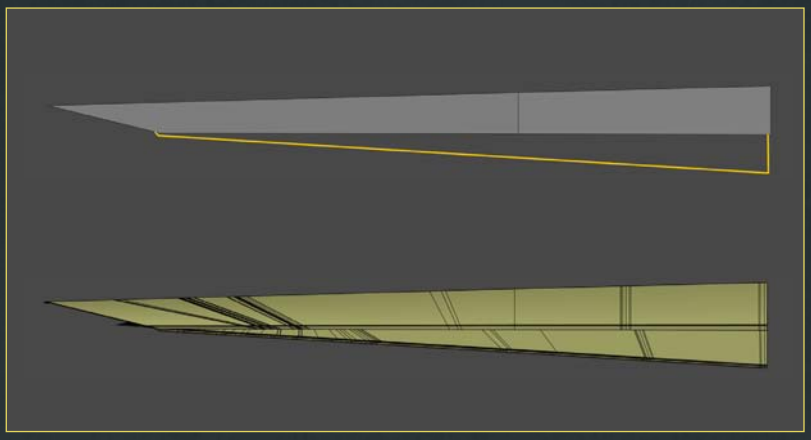


Fig 06

Let's move to the mid-section. Compared to the part we made earlier, I made a change to the profile of this part. Also I made big side indentations so that our shape fits the concept.

Using all the standard tools covered so far, I added some details to the front part of this section to follow up on our concept.

You might want to add some details to the bottom part as well. The first two parts should look something like this (**Fig.06 – 06h**).

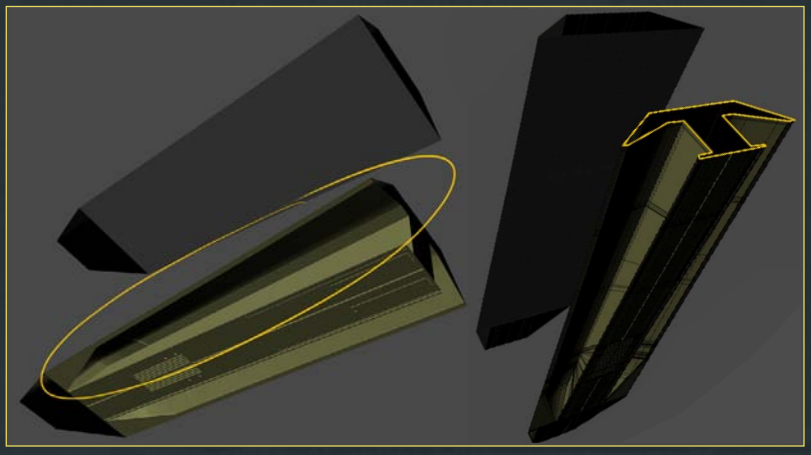


Fig 06a-b

Compared to our low poly part I decided to cut our next piece and make it much smaller and easier to manage.

I also split the top and bottom apart for easier management and manipulation.

Fig 06c-d

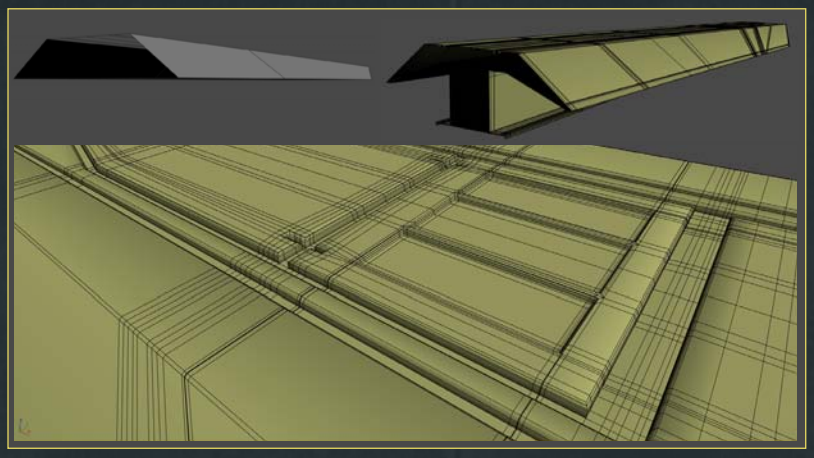


Fig 06e-f

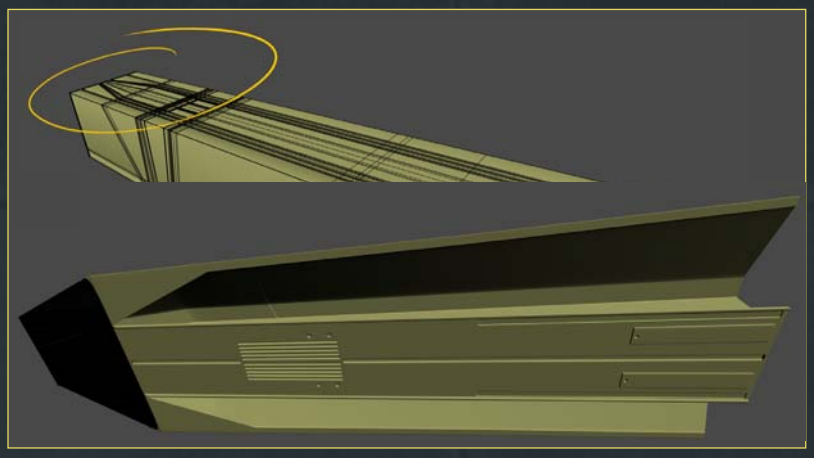
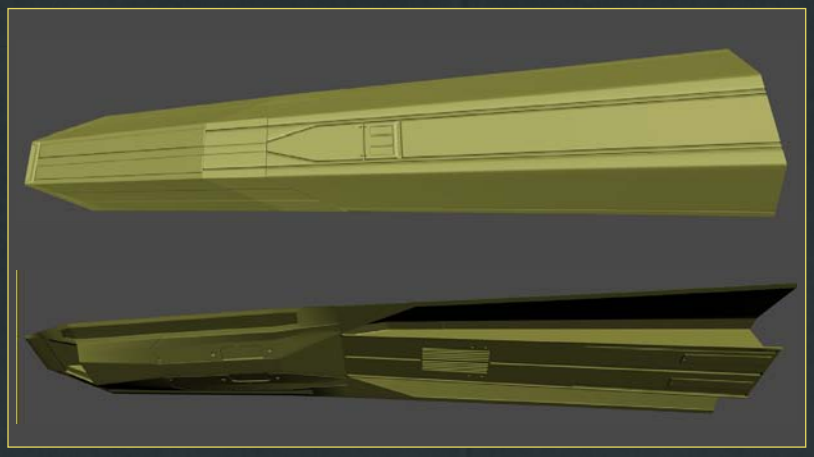


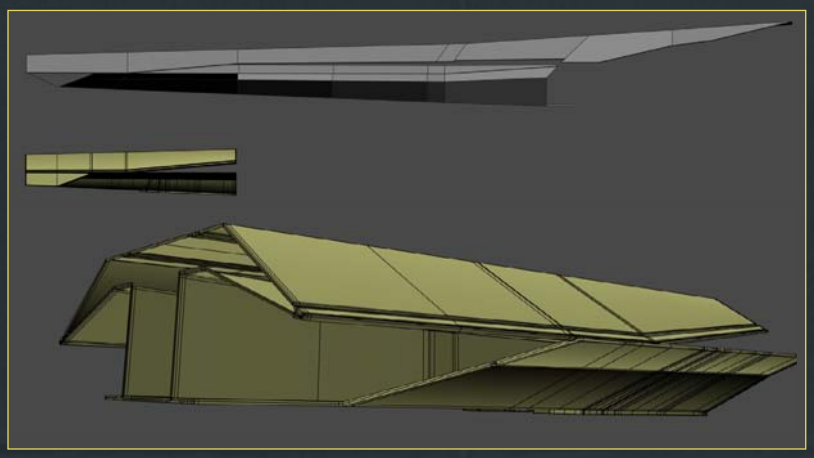
Fig 06g-h



You can separate the desired pieces of geometry by selecting the polygons you wish to separate and hitting the Detach button (in the Command panel or the ribbon) (**Fig.07 – 07b**).

First I made a recess for the top part by simply extruding some edges and Welding a few vertices together. The Weld tool combines selected vertices. You'll be using this tool a lot. On the top part of the piece I added some details using SwiftLoop, Extrude and Chamfer.

Fig 07-07a



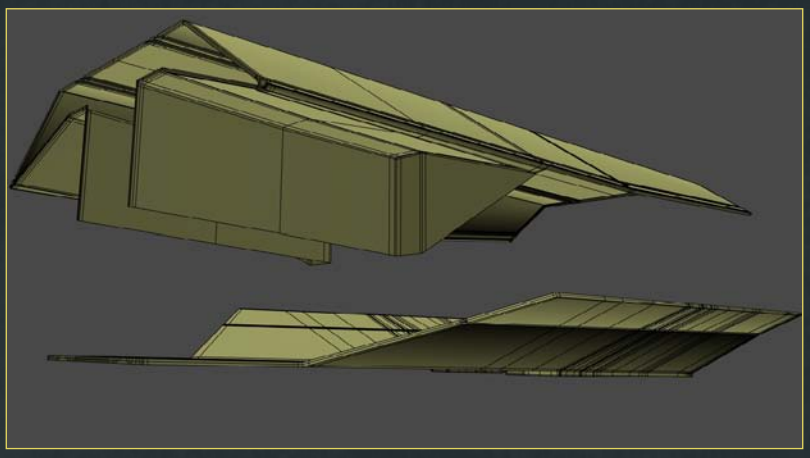


Fig 07b

Using the same methods I added details to the side as well (**Fig.07 – 07f**).

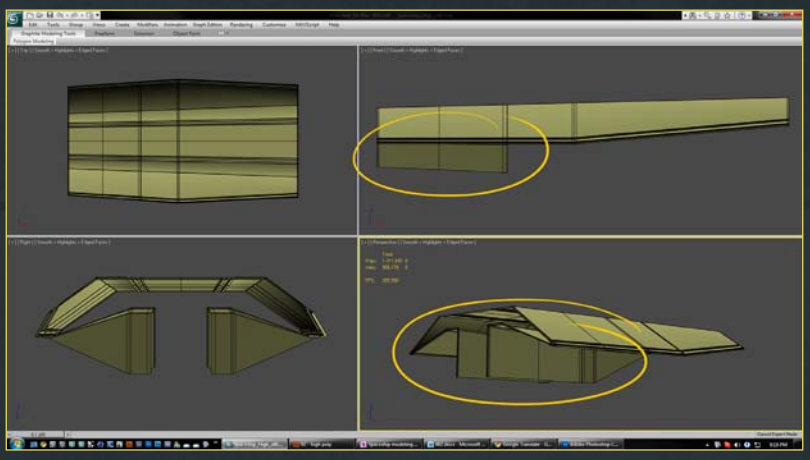


Fig 07c

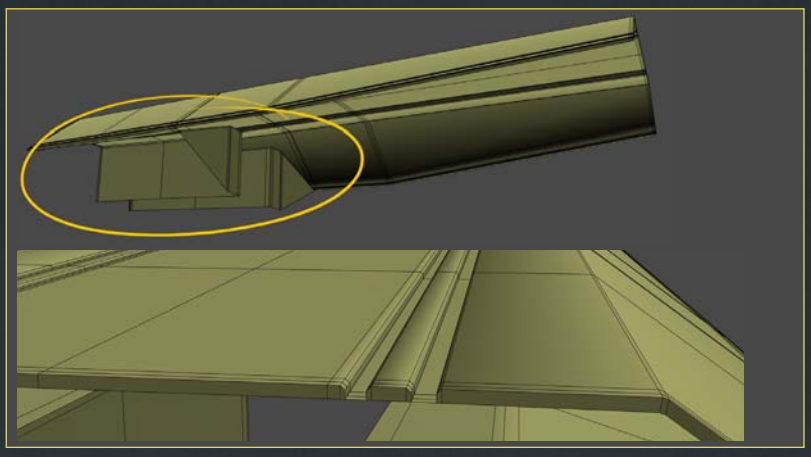


Fig 07d-e

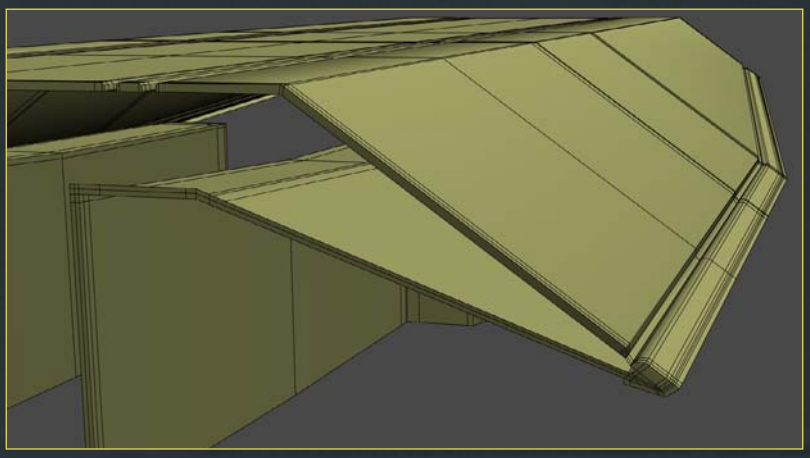


Fig 07f

To the bottom part of this mid-section piece I added some details similar to the ones on the bottom of the nose (**Fig.08 – 08a**).

Fig 08

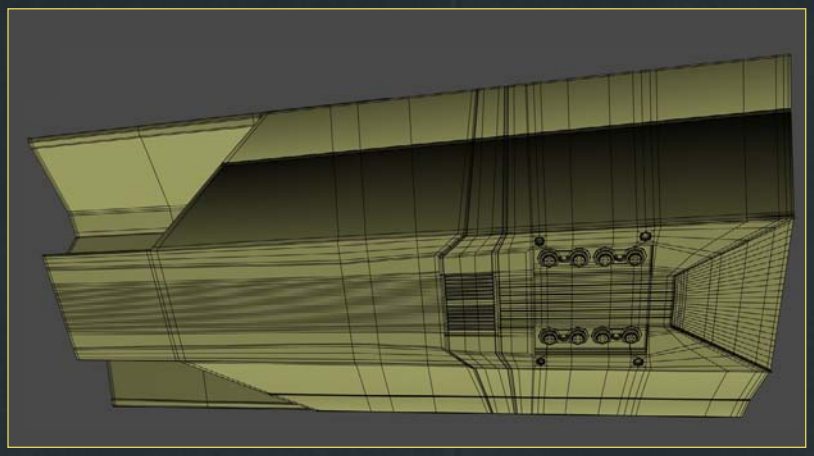
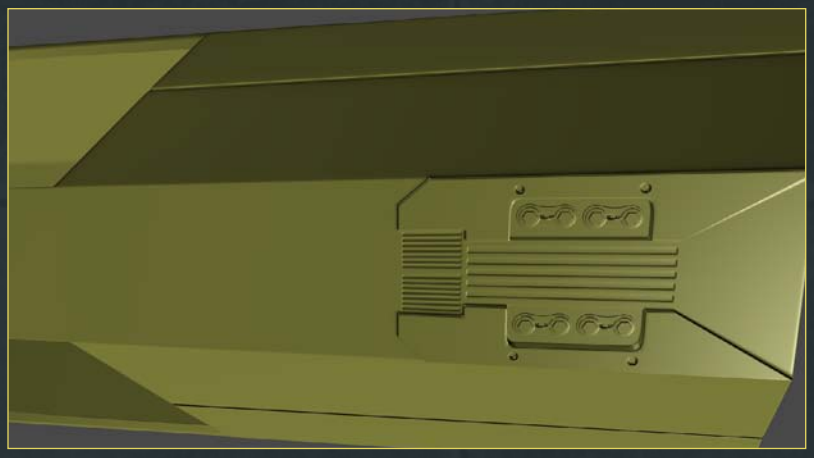
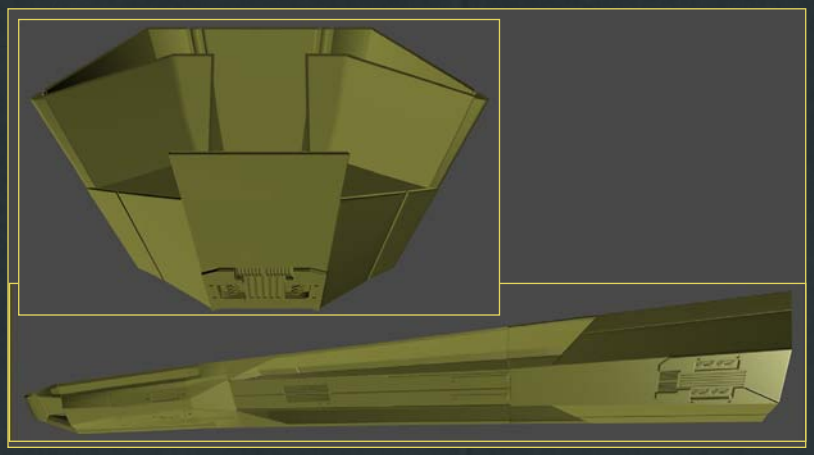


Fig 08a



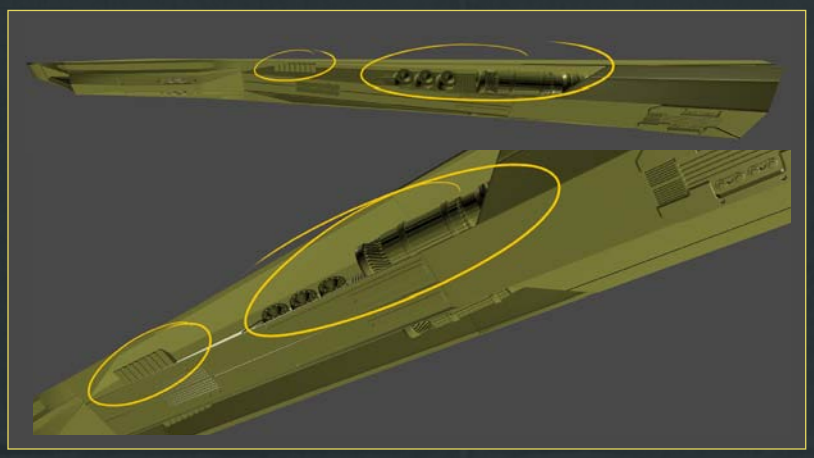
So far you should have something like this (**Fig.08b – 08c**).

Fig 08b-c



Now let's move on to adding some extra pieces to the mid-section (**Fig.08d – 08f**).

Fig 08d-e



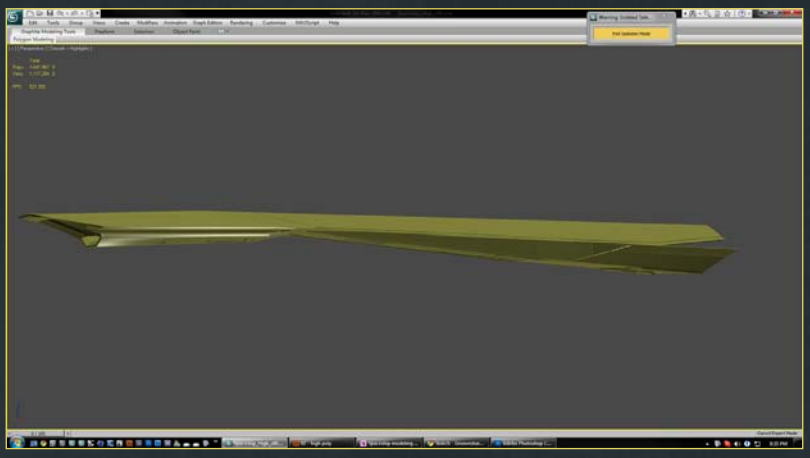


Fig 08f

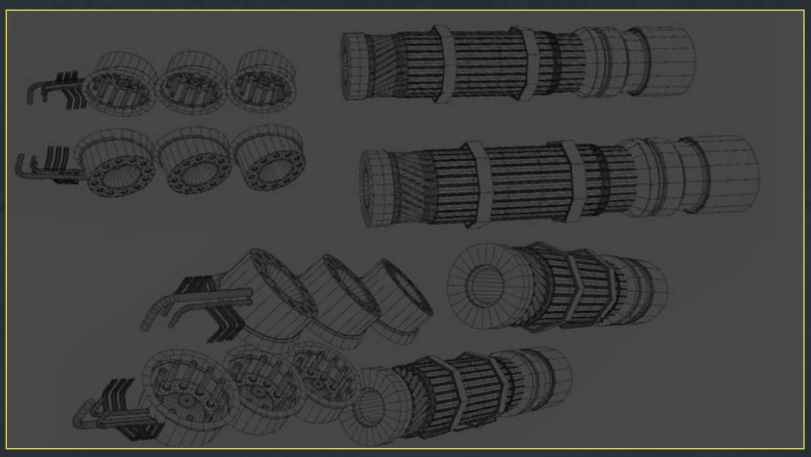


Fig 09-09a

Following our concept, the pieces should look similar to this (**Fig.09 – 09a**). The back parts are simple cylinders. You can play a bit with extruding and scaling until you get the shape you want (**Fig.09b**).

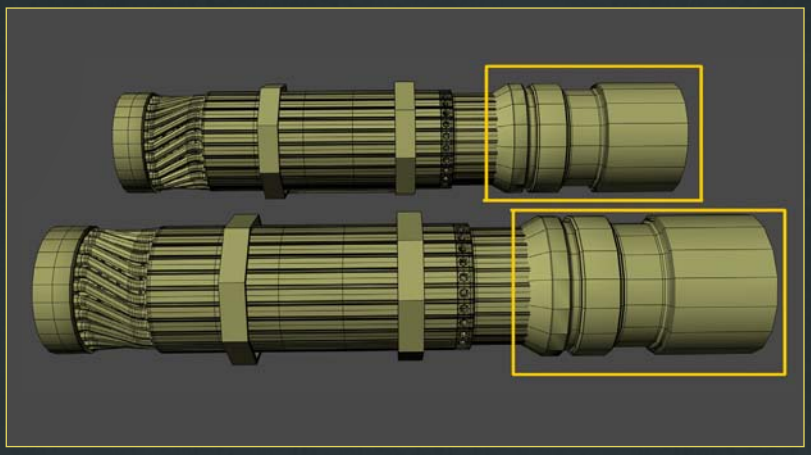


Fig 09b

The mid-section of this piece was a bit more complicated. I started with a 22-sided cylinder. Then I deleted all the sides except one – leaving me with only one polygon, which had a pivot at the center of the original cylinder. Using the Shell modifier I added some thickness and then deleted the back (or inside) polygon. You can add some extra details if you like. Then I added some holes.

When you're satisfied with the section, you can use the Array tool to revolve the section and get a cylinder made out of 22 identical sections. You can find the Array tool by going to Tools > Array. With this tool you can create an array of objects based on the current selection. You can create one-, two-, and three-dimensional arrays. Bear in mind that when creating a circular array, the position of the pivot is crucial because the objects will be translated around that point. You should take some time to explore this tool because it can be quite handy in lots of situations (**Fig.09c – 09d**).

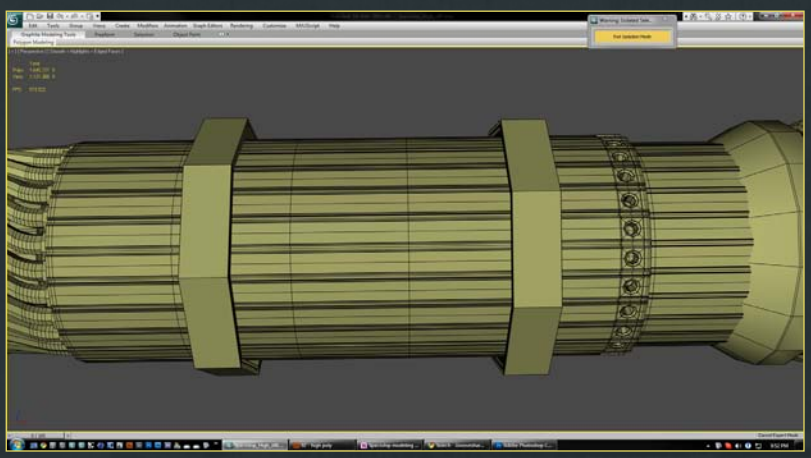
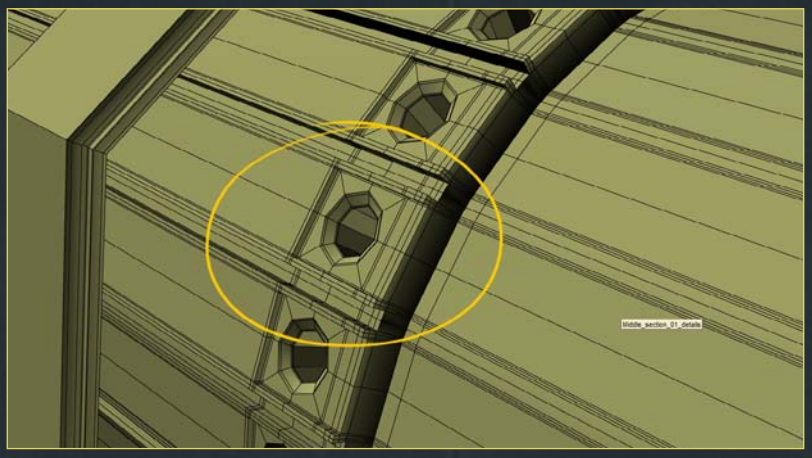


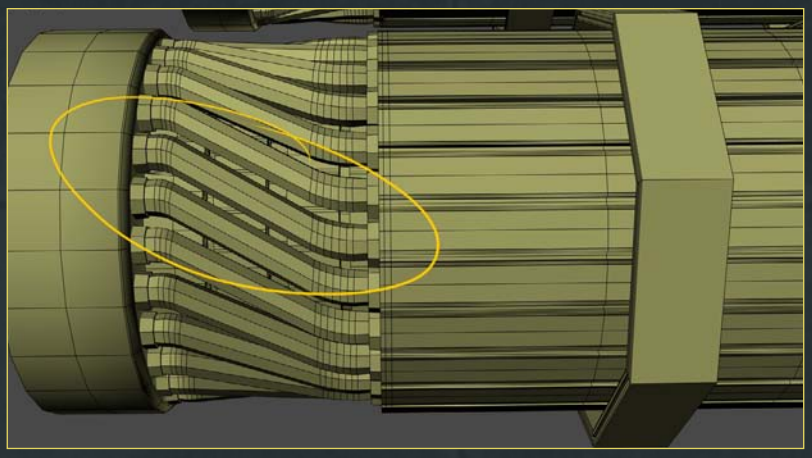
Fig 09c

Fig 09d



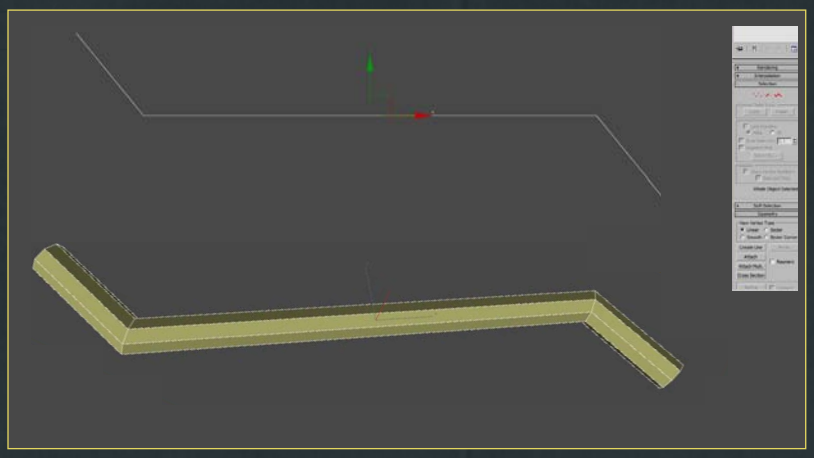
The curved pipes can be created quite easily in 3ds Max. You can start by creating a simple Spline (**Fig.10**).

Fig 10



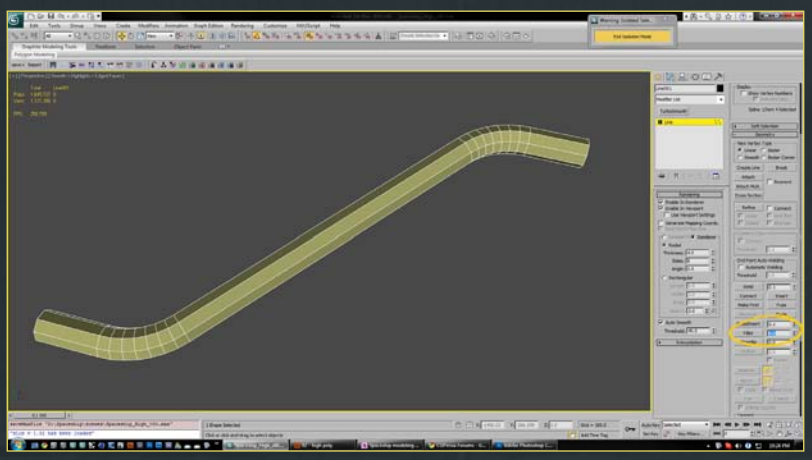
Next go to Command > Create tab > Shapes and select Line. Draw the desired shape. Under the Rendering rollout, in the Command panel, check Enable In Renderer and Enable In Viewport. Immediately you'll get geometry created out of your spline. You can use the Thickness and Sides settings to further define the look of your shape.

Fig 10a-b



The great thing about using splines to create shapes is that you can now go back and refine the whole shape by refining the spline. Select a spline, go to spline sub-object level 1 by hitting the 1 on your keyboard, select the angle points and change the Filet value in the Geometry rollout. When you're happy with the look of your pipe you can use the Array tool again to revolve it and you should get something like this (**Fig.10a – 10d**).

Fig 10c



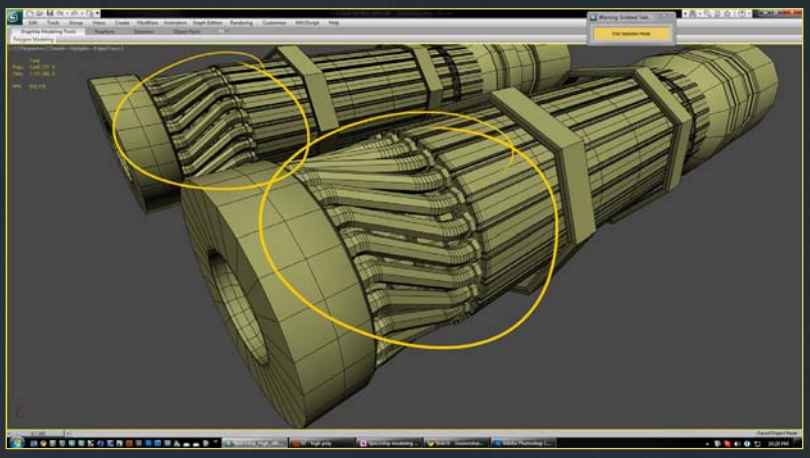


Fig 10d

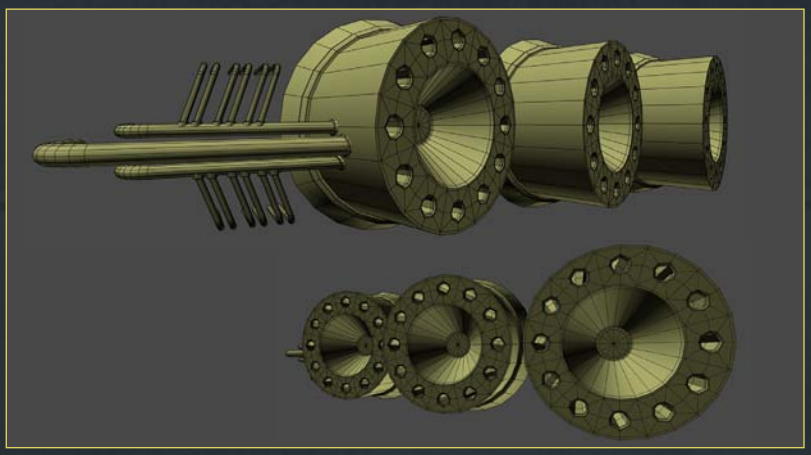


Fig 10e-f

The front cylindrical part should be quite easy for you to create by now. The same applies for the rest of the mid-section details (**Fig.10e – 10h**).

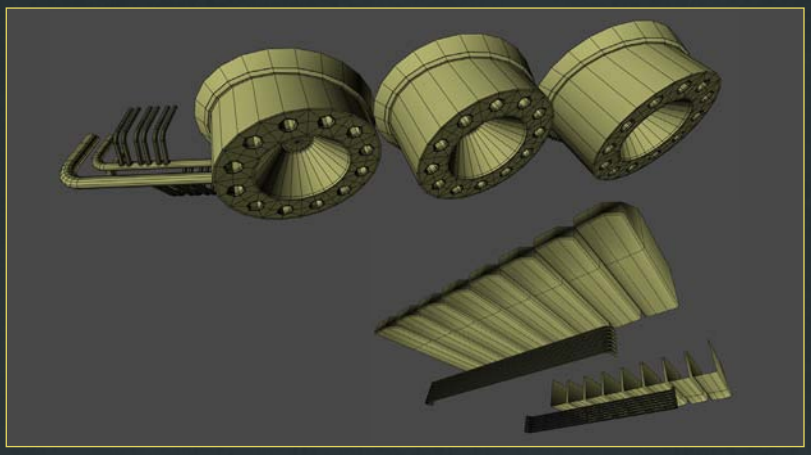


Fig 10g-h

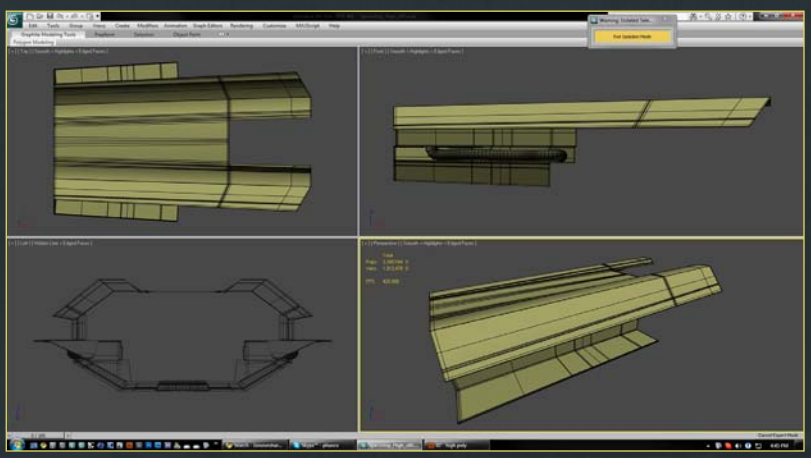


Fig 11

Move along towards the back of the ship.

The next section is similar to the previous one. The top and bottom parts are separate pieces of geometry with some detailing done on both parts.

For the wavy tubes I used a spline to make a basic shape. Then I selected every other poly loop and just extruded a bit (**Fig.11 – 11f**).

Fig 11a

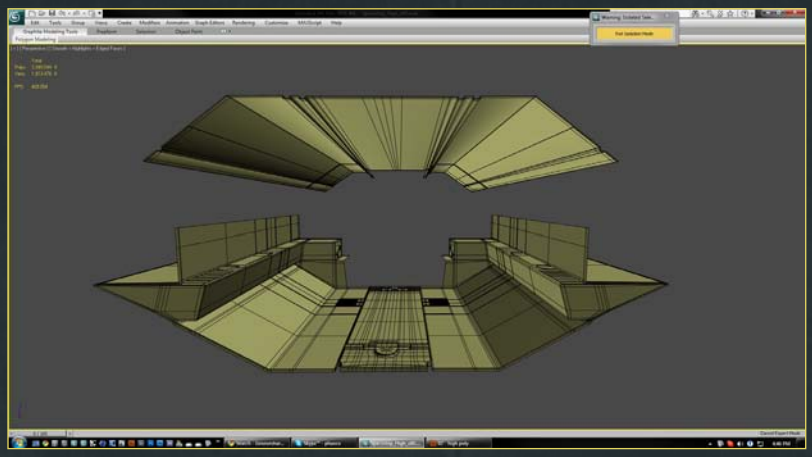


Fig 11b-c

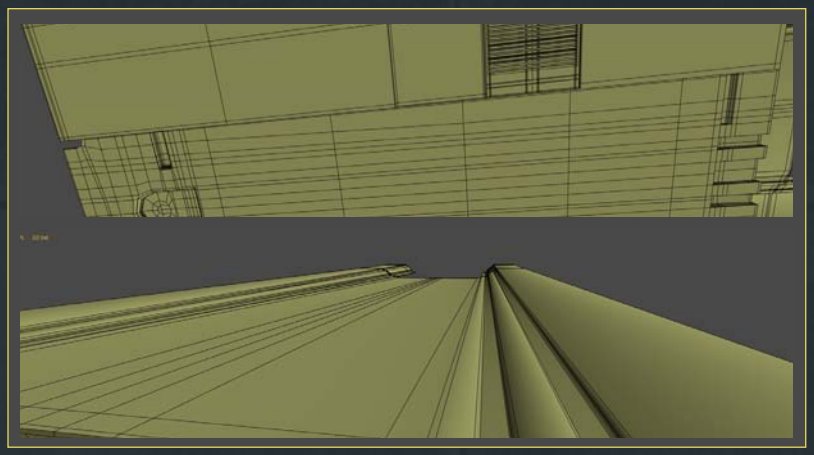
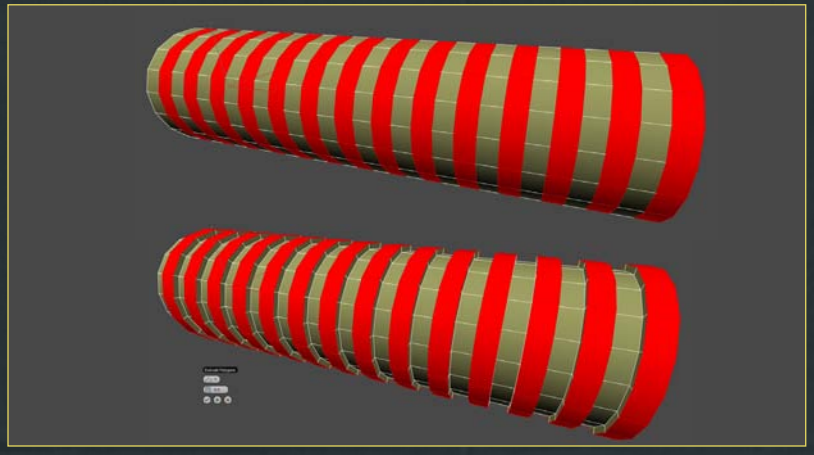


Fig 11d



Fig 11e-f



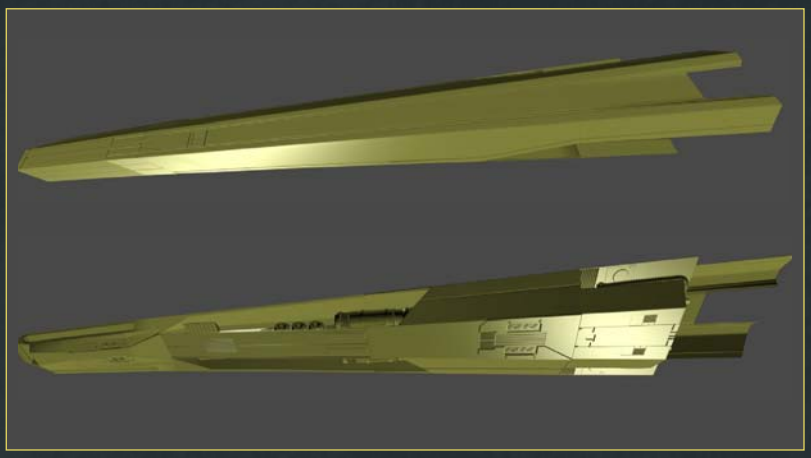


Fig 12-12a

And this is what we have so far (**Fig12 – 12a**). The next section is a bit more complex, but is built using all of the standard techniques we've covered so far.

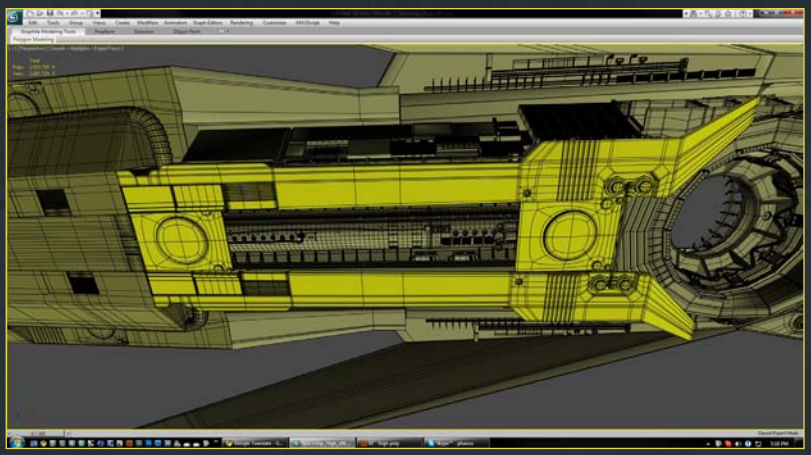


Fig 12b

You can see the main features of the shape from the top view. It's a long rectangular form with big hole in the middle and small wing-like shapes at the back. There are some details on the root of the wings and on the bottom part in general. The hole in this section has a purpose, which is to show some parts inside the ship. That's what we are building next (**Fig.12b – 12e**).

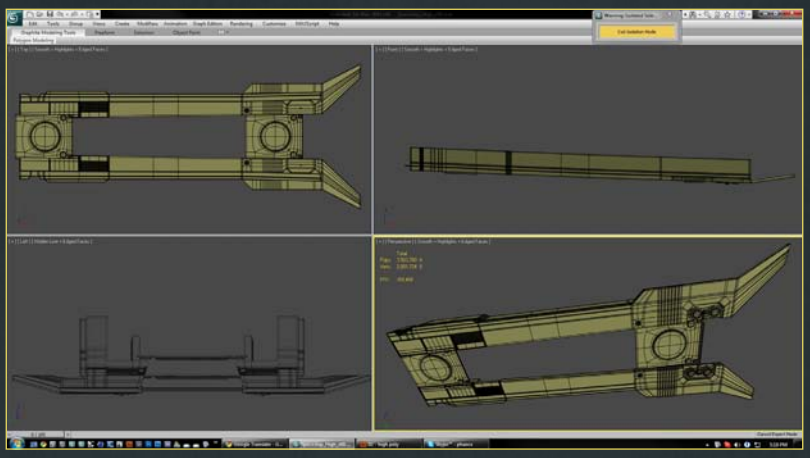


Fig 12c

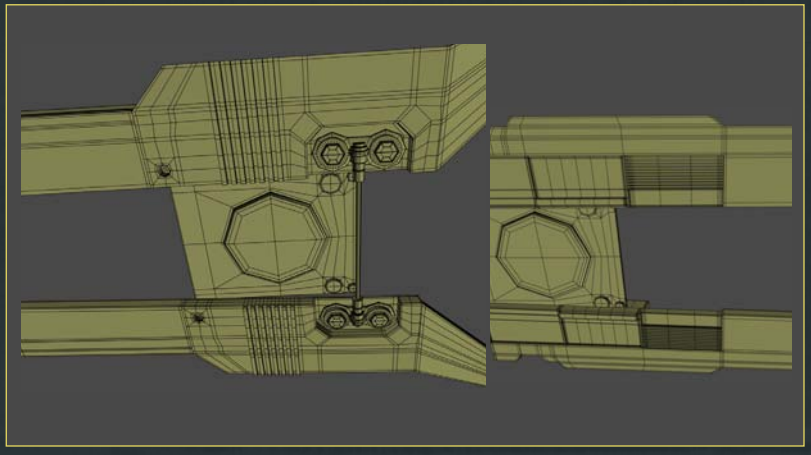


Fig 12d-e

The inside section is composed out of several geometry pieces. The main part is a big, central, cylindrical shape around which everything else is build. Basically it's just a cylinder with some details in it to make the form more interesting (**Fig.13 – 13c**).

Fig 13-13a

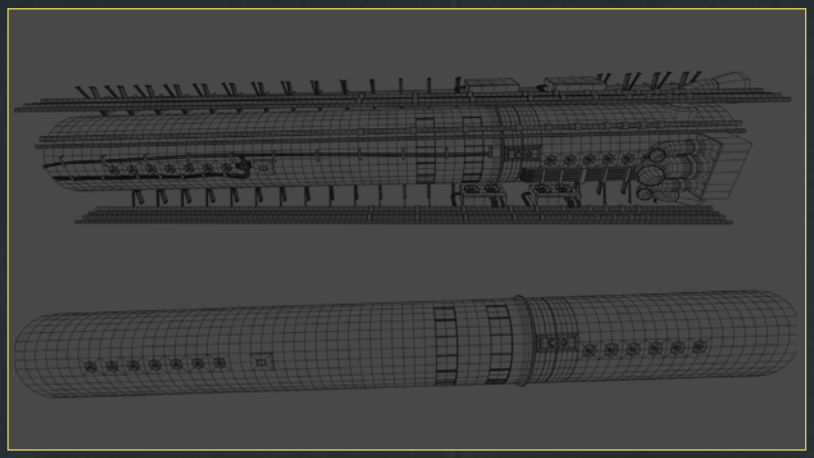


Fig 13b

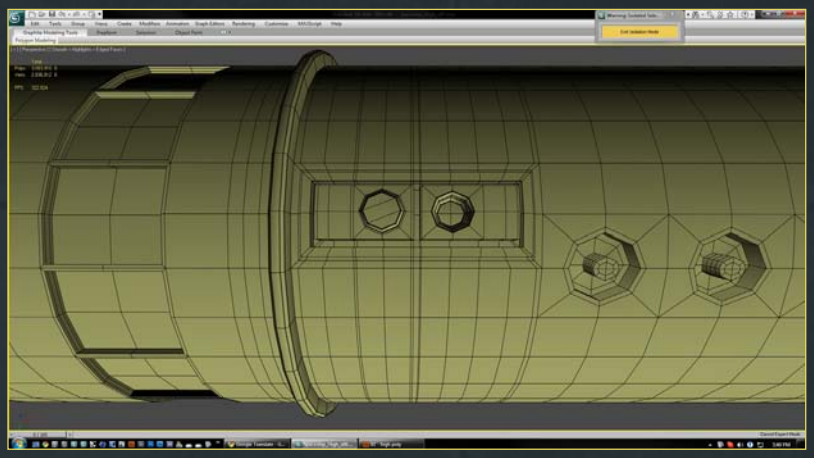
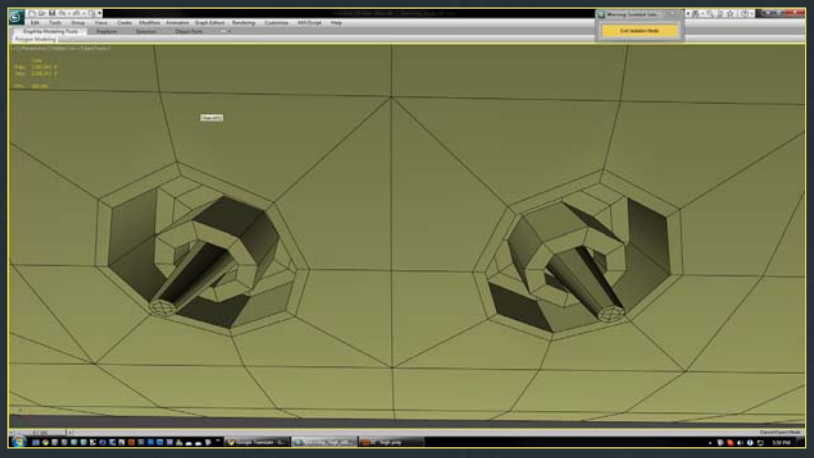
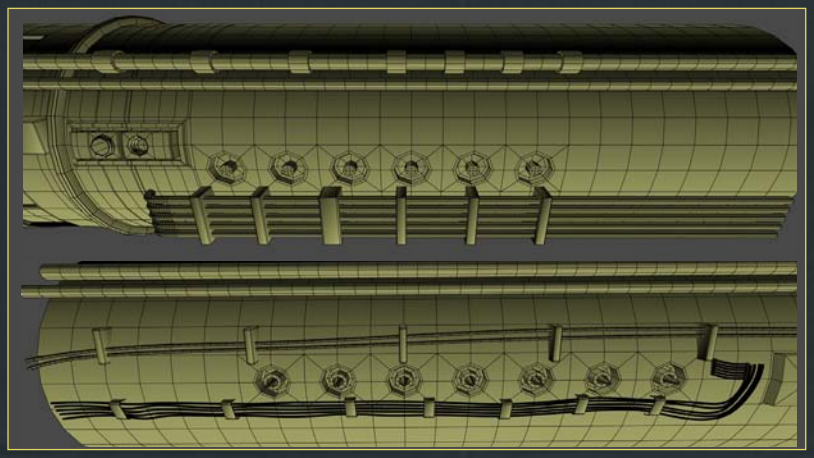


Fig 13c



Next I added some more piping using splines (**Fig.13d – 13e**).

Fig 13d-e



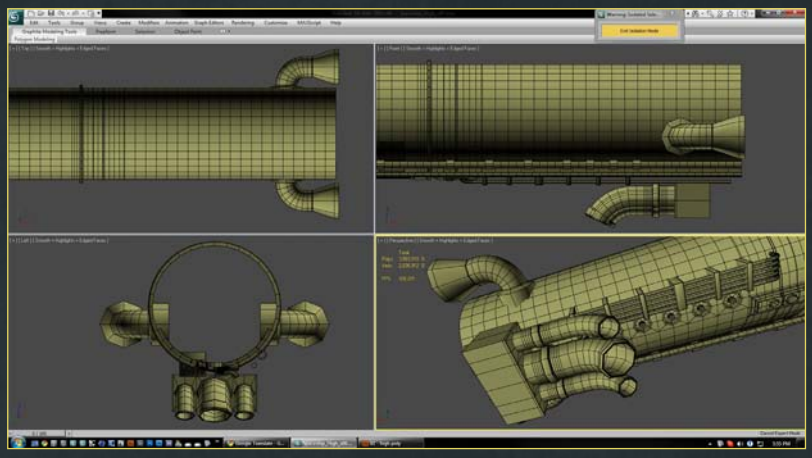


Fig 13f

Then I added some exhaust pipes at the back end of the section (**Fig.13f**).

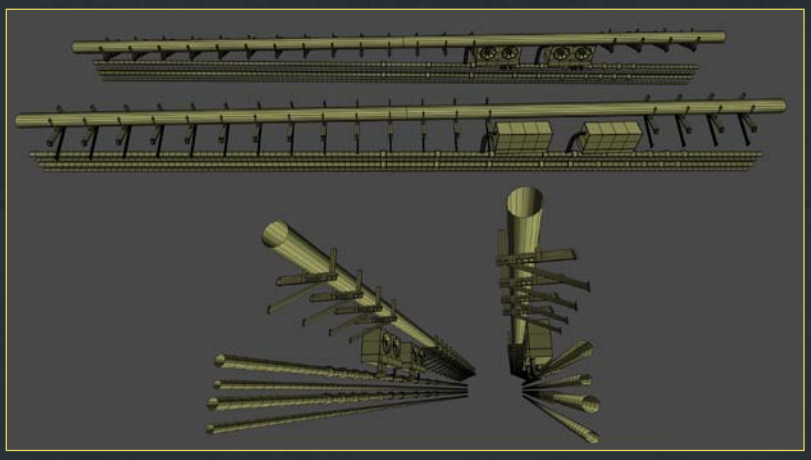


Fig 13g-h

And finally some more pipes, a support structure (built using the Array tool) and cooling units. This whole system was then placed around the main big pipe (**Fig.13g – 13j**).

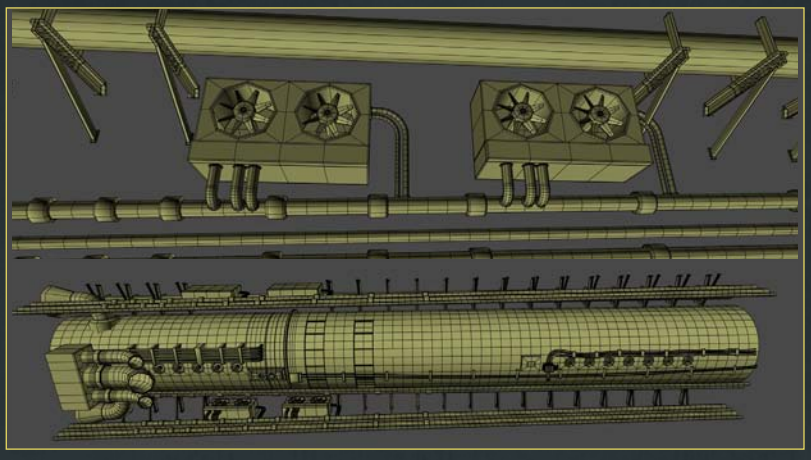


Fig 13i-j

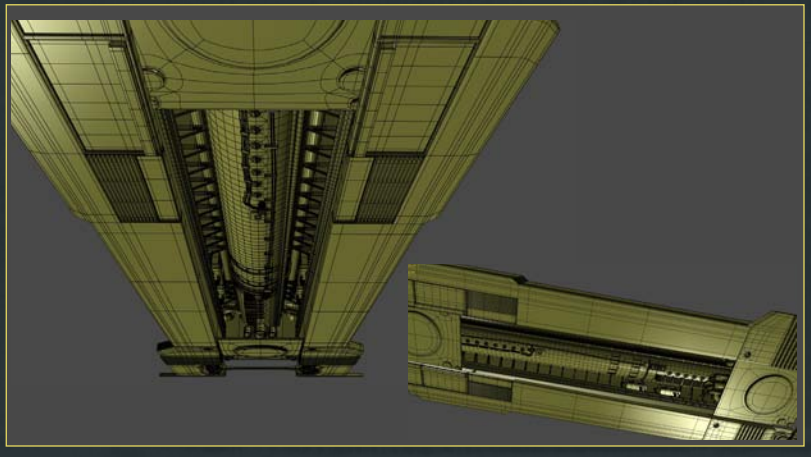


Fig 13k-l

Combined with the previous section, you should have something like this (**Fig.13k – 13l**).

To follow up on our concept we need to add some details to the side of the ship, just above the previous section (**Fig.14**). You can see that there are some basic box shapes there, representing some sort of panels. Most of them were made out of simple planes. Some thickness was added using the Shell modifier and some further details were added at the end.

Also I decided not to use smoothing on these parts, so I just chamfered some edges to avoid artificially sharp lines (**Fig.14a – 14c**).

Fig 14

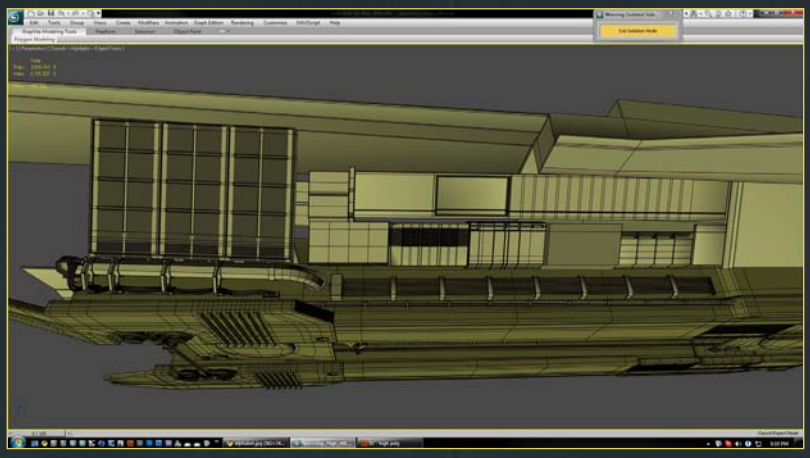


Fig 14a

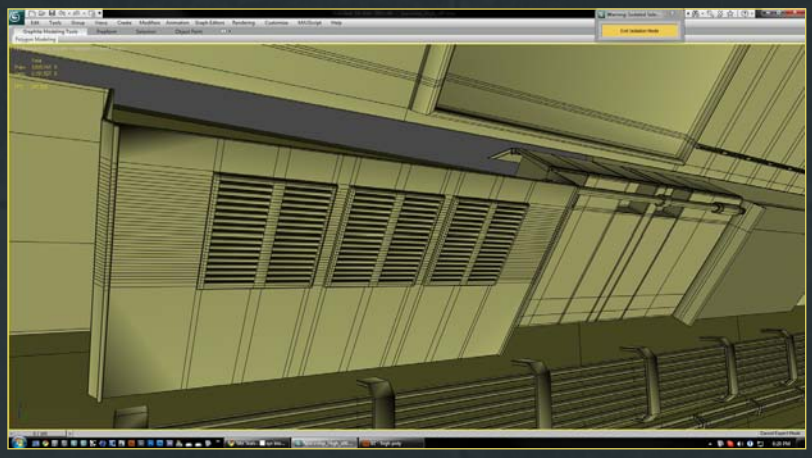


Fig 14b

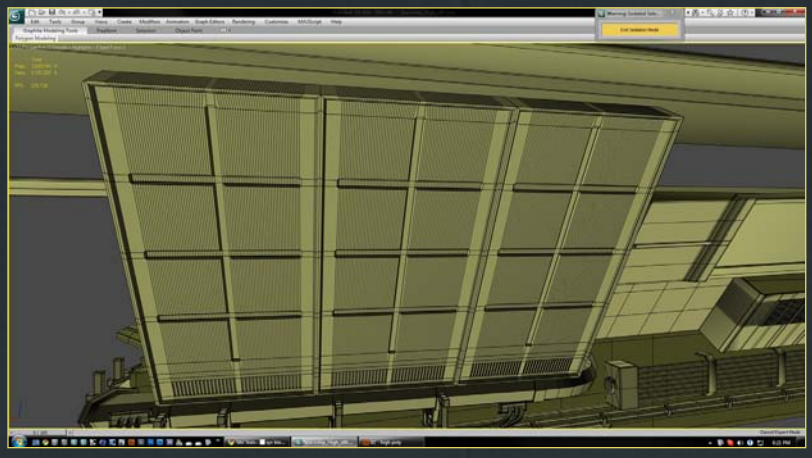


Fig 14c

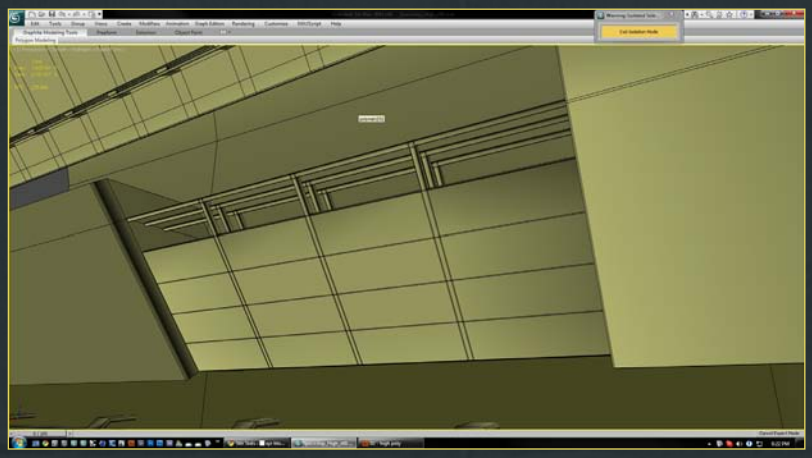




Fig 14d

Of course we need some more pipes. And one more big pipe at the back, accompanied by some cables. Cables are built using splines just like before, except in this case you'll have to play a bit more with them in order to get the shape and flow to look natural (**Fig.14d – 14f**).

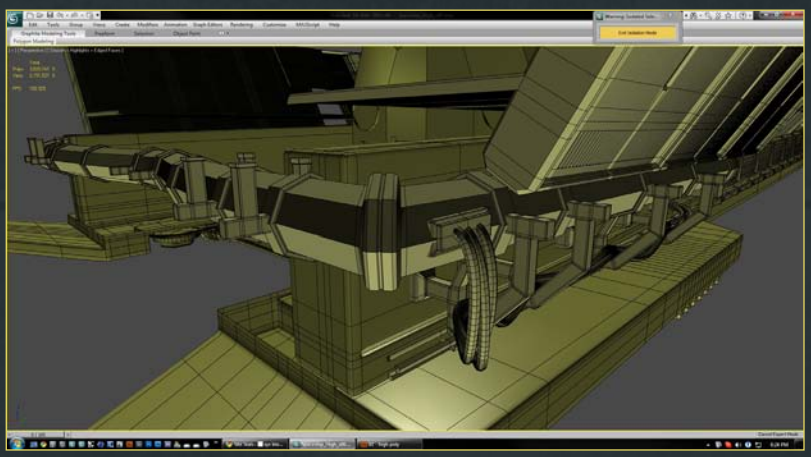


Fig 14e

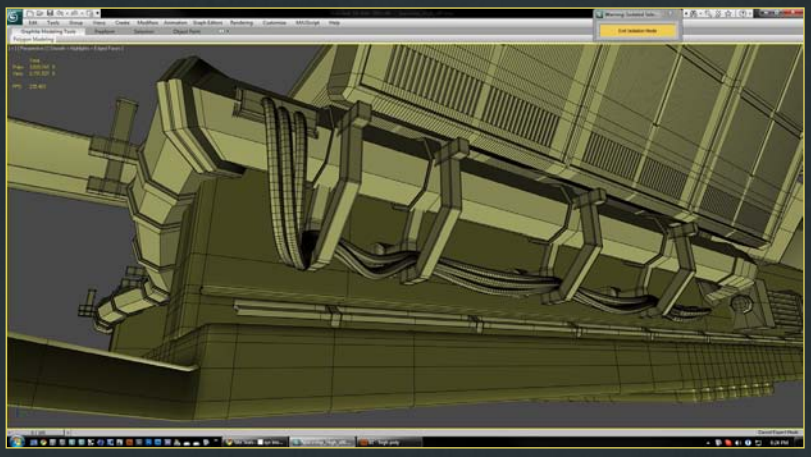


Fig 14f

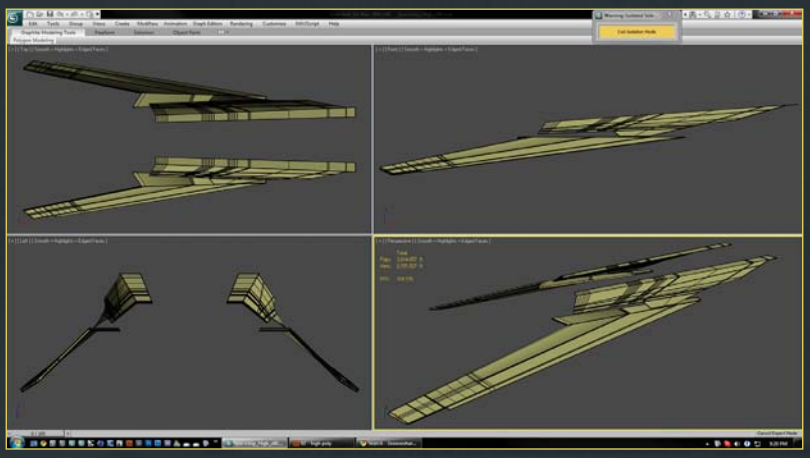


Fig 15

The wings and top back segments of the ship are pretty simple pieces. After making the main shapes I just added a Shell modifier and added some details on top of that (**Fig.15 – 15b**).

Now on to some details around the engine. These parts were not drawn in the original concept, but I decided to add some details to this part of the ship as well.

First I added some pipes. The basic shape was made with splines. At the end of the pipes I added some joints that will later be connected to some other engine parts.

You can easily create a shape like this just by adding an extra primitive, then doing some cutting and bridging.

The Bridge tool connects pairs of polygons by adding extra geometry in between.

I then created some more geometry to fit in between pipes, and some extra, exhaust-like details at the end (**Fig.16 – 16f**).

Fig 15a-b

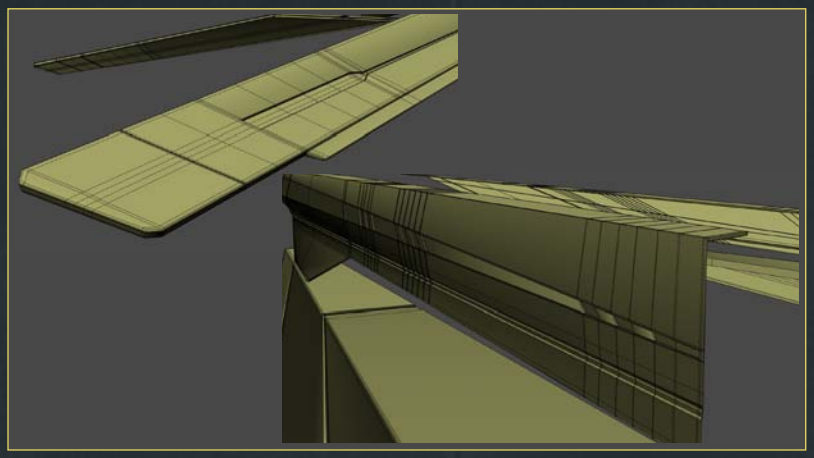


Fig 16-16a

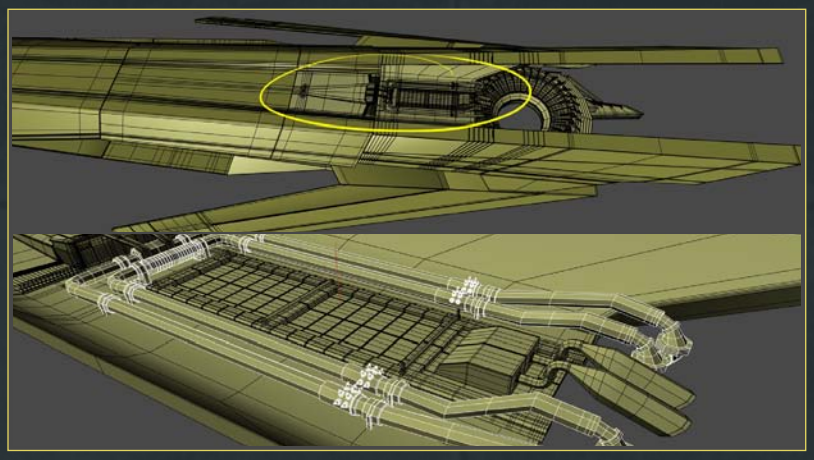


Fig 16b-c

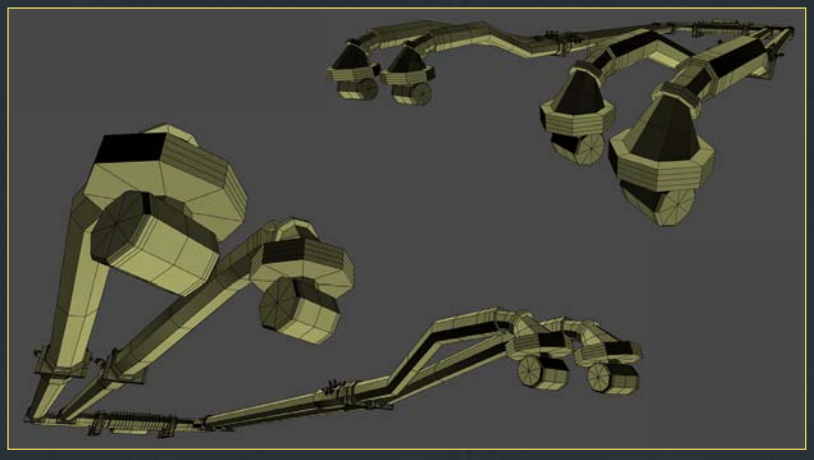
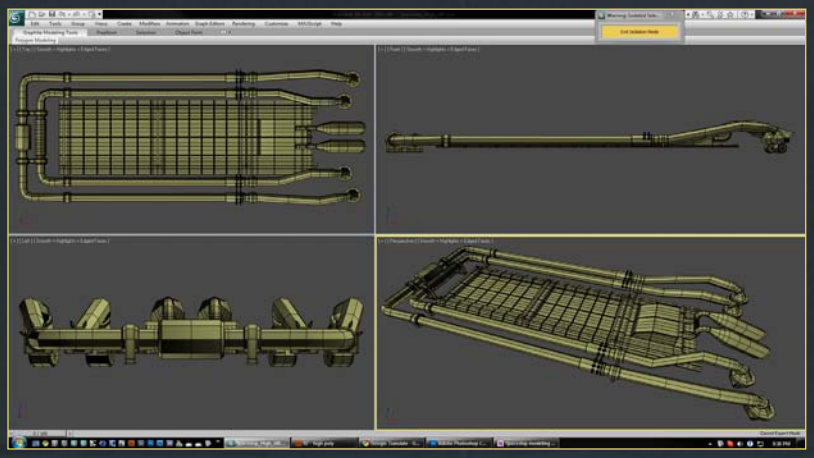


Fig 16d



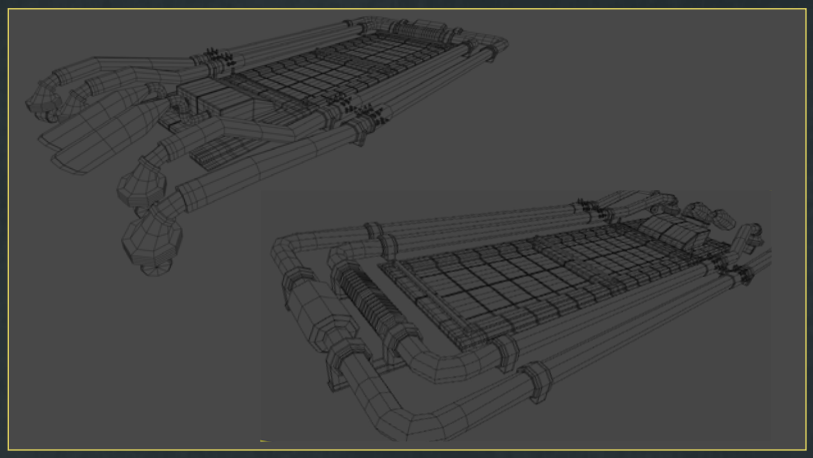


Fig 16e-f

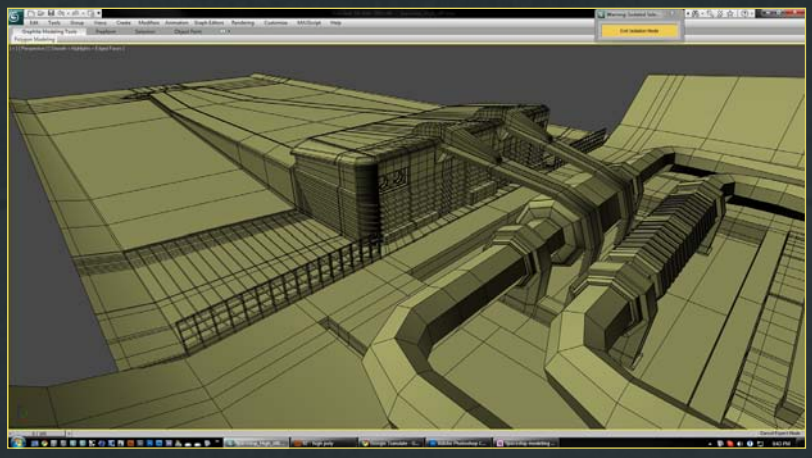


Fig 16g

As the last part of the section, I added one more support structure and connected it to the pipes (**Fig.16g – 16h**).

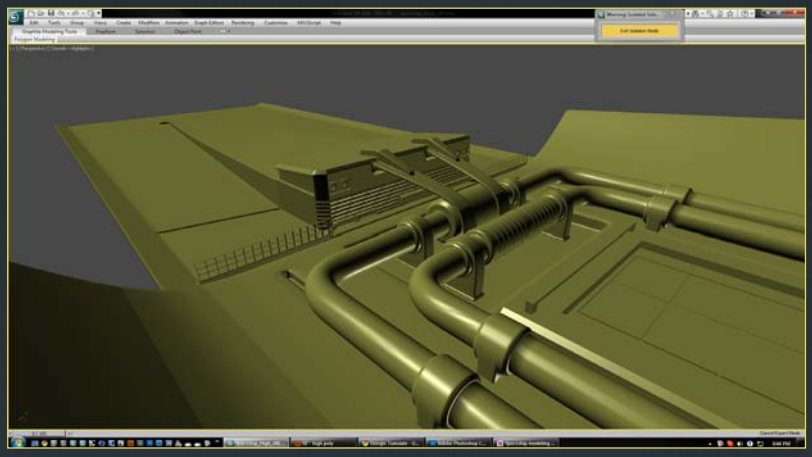


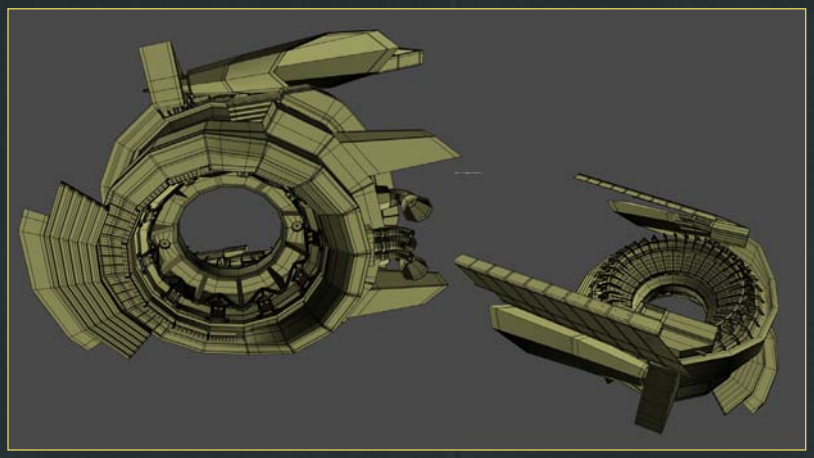
Fig 16h



Fig 17

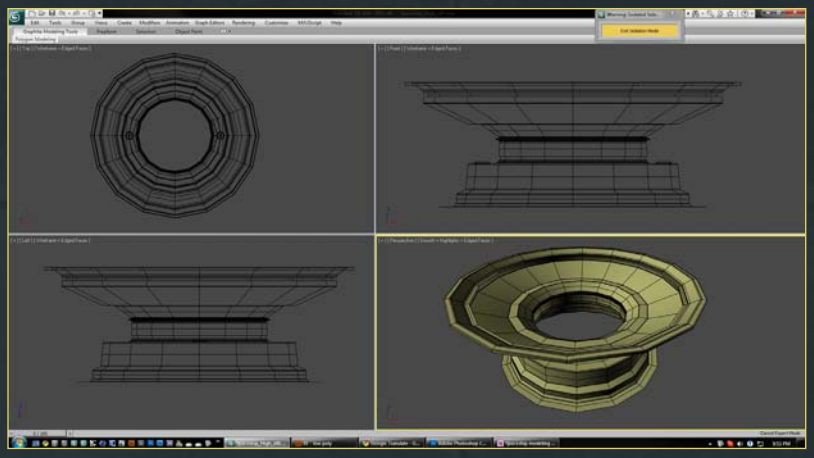
The “engine” part is made out of several different components, which are pretty simple when broken down (**Fig.17 – 17b**).

Fig 17a-b



Let's start from the inside out. This is the shape as we left it in a previous chapter (**Fig.17c**).

Fig 17c



First I built some simple support structures for the bottom part of the engine, like the one in the concept art. Then, using splines, I made some cables and carefully placed them to avoid interpenetrations. Just below the cables I made some wires and extra details, which were than duplicated in a circle using the Array tool (**Fig.17d – 17h**).

Fig 17d-e

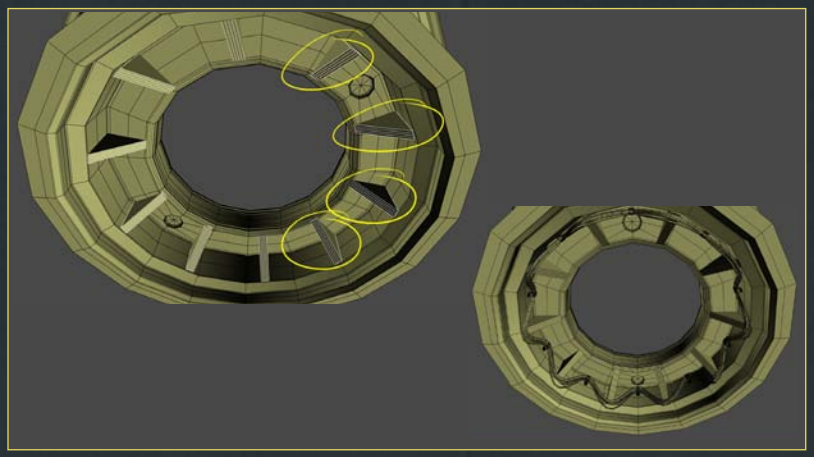
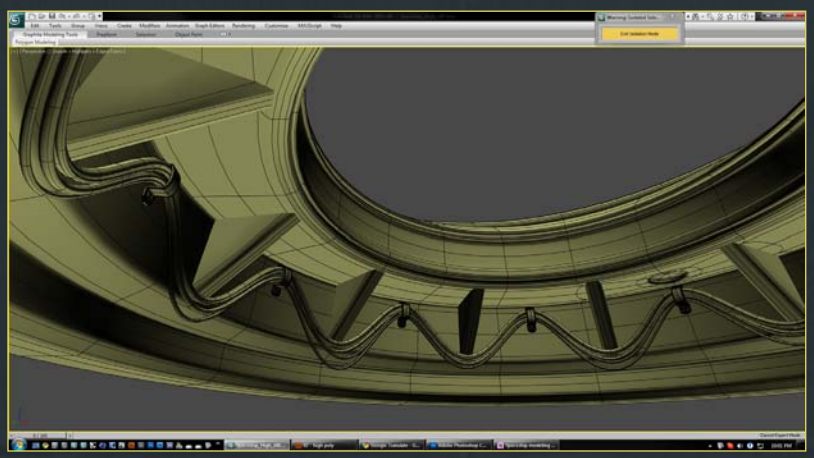


Fig 17f



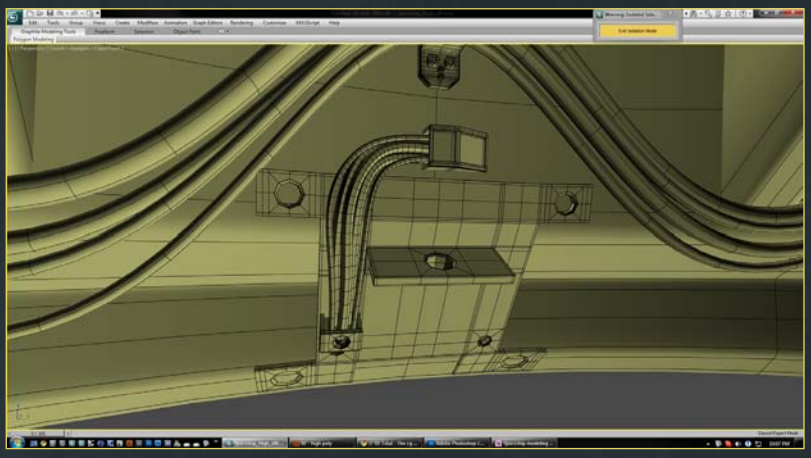


Fig 17g

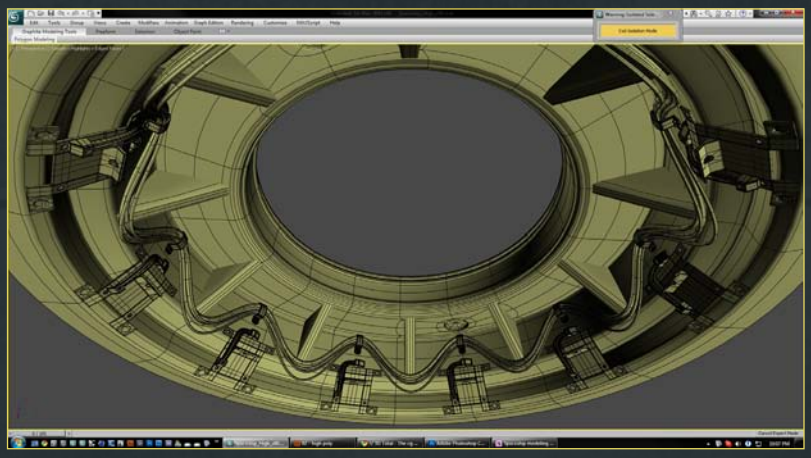


Fig 17h

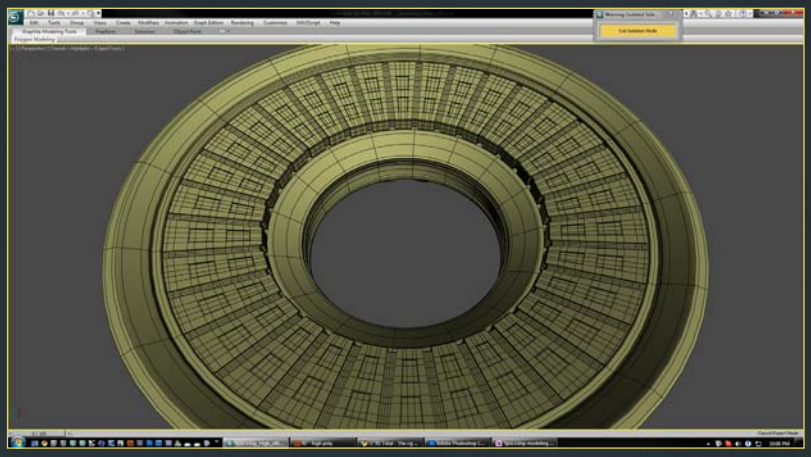


Fig 17i

On the top part there's a simple repetitive piece of geometry. You can make a single piece and duplicate it using the Array tool (**Fig.17i**).

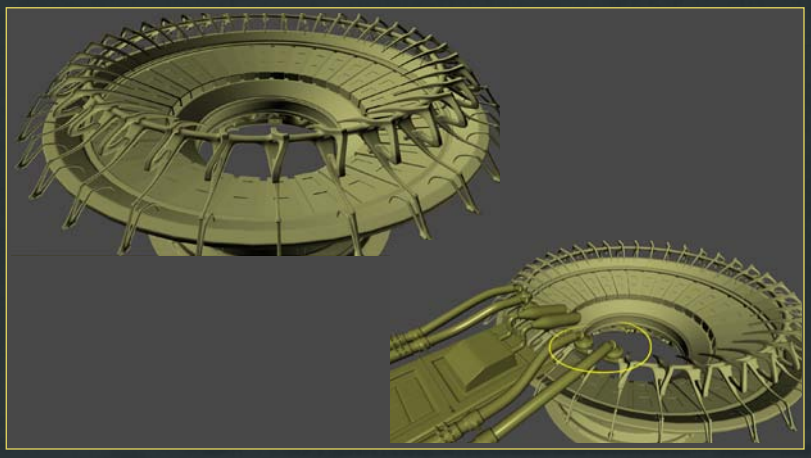


Fig 17j-k

The top of the engine was a bit simple to me, so I added this nozzle-like structure and connected it to the pipes we created before (**Fig.17j – 17k**).

Next you can add some exhaust pipes to the side, even though they are not on our concept art. I've connected the exhausts with a piece of geometry that goes around the engine, just to block the view so that we can't see inside the ship. At the bottom of the engine I made a massive ring that goes around it and extends a bit towards the back. In the back part you can add a ring-like shape to close the engine (**Fig.18 – 18e**).

Fig 18

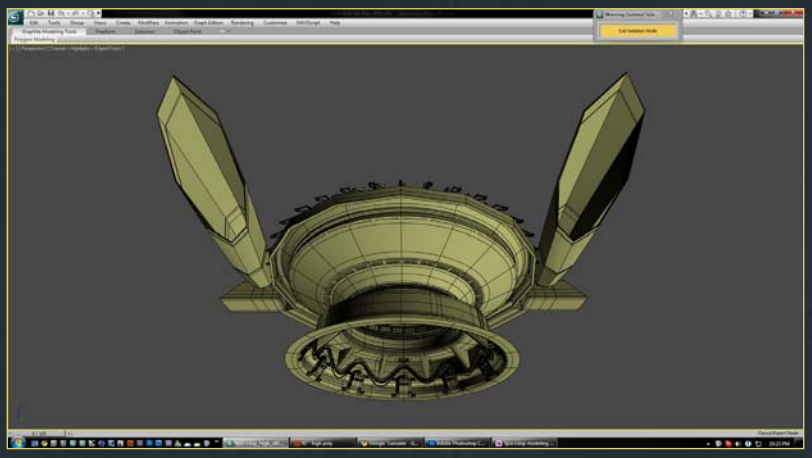


Fig 18a

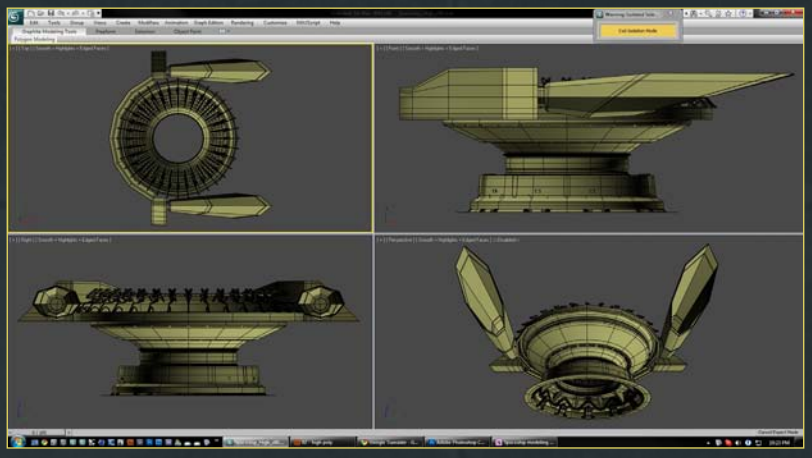


Fig 18b

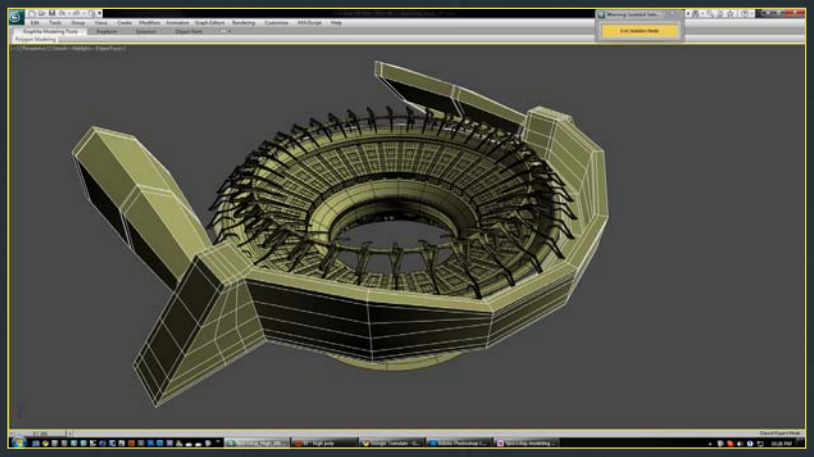
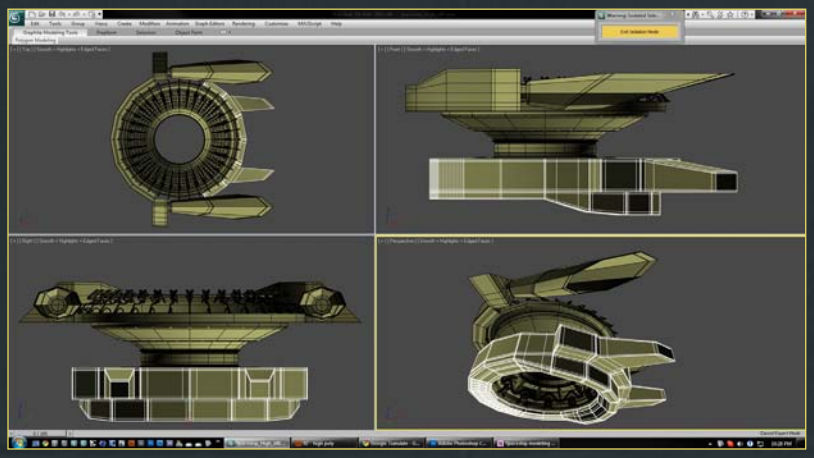


Fig 18c



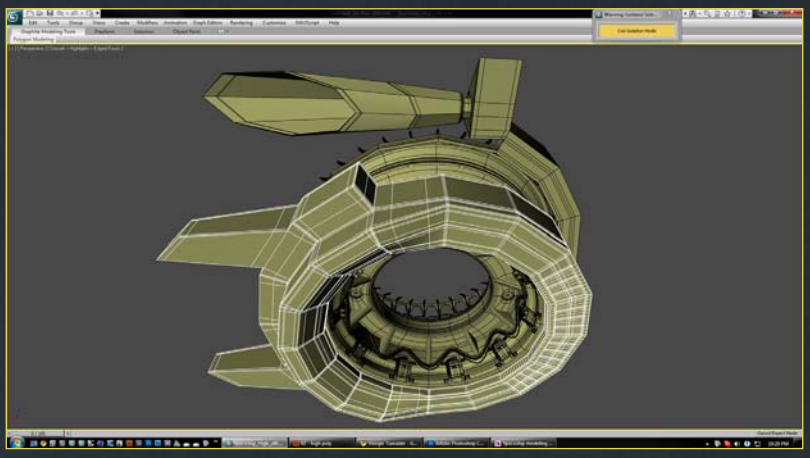


Fig 18d

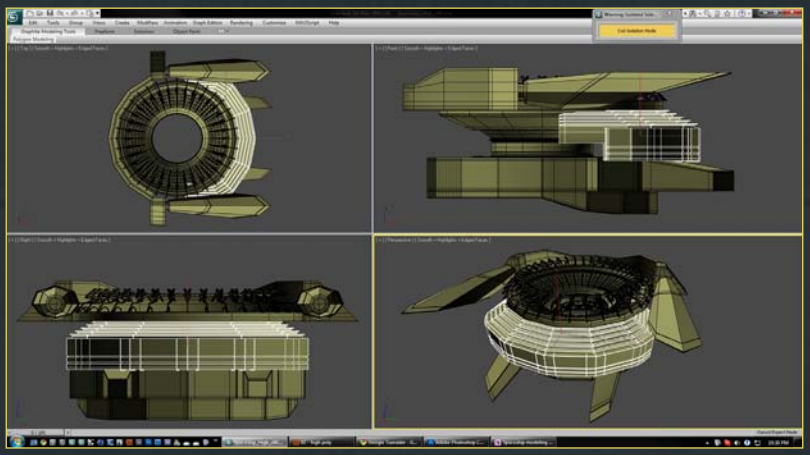


Fig 18e

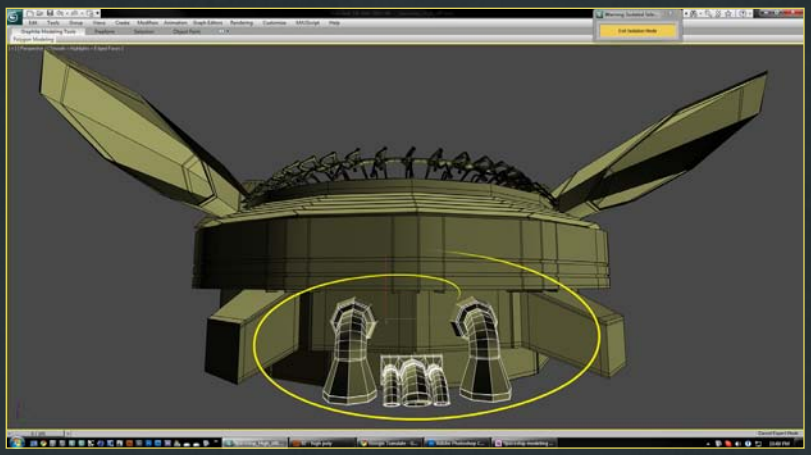


Fig 18f

And finally you can add a few more details, like I did with some pipes at the back, some artificial structures at the bottom and some smaller exhausts and cables just above the main exhaust (**Fig.18f – 18i**).

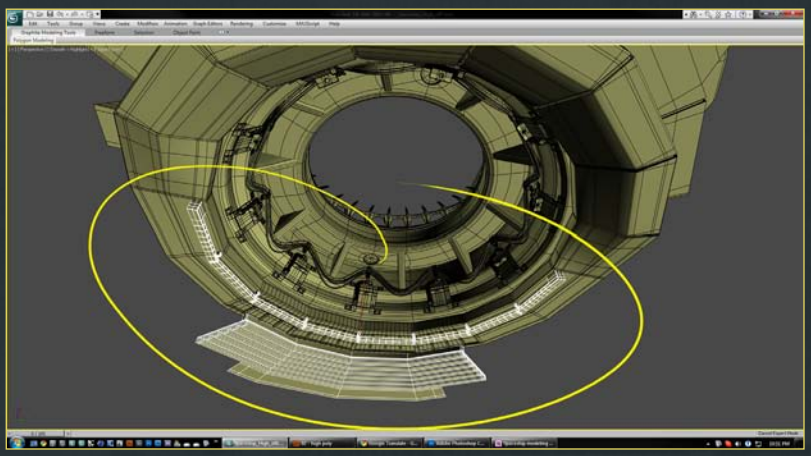


Fig 18g

Fig 18h

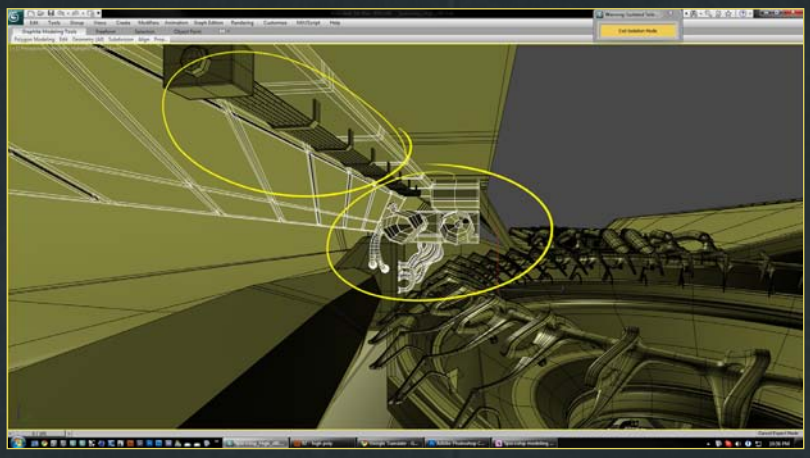
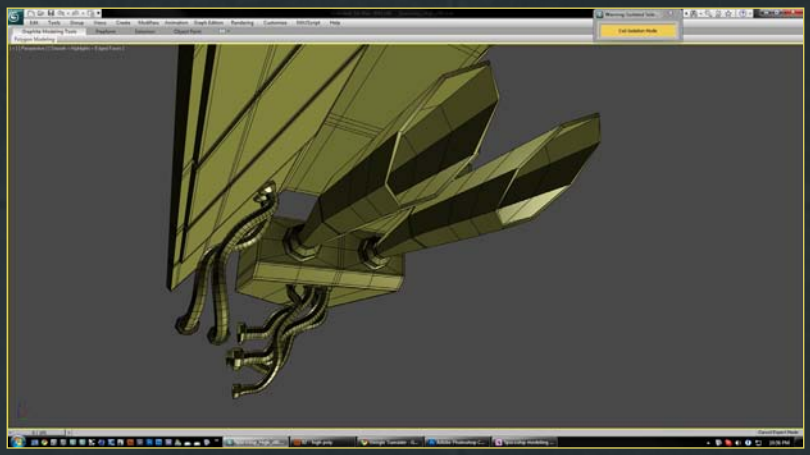


Fig 18i



We only have few pieces left now. First there are small wings that go from the bottom of the engine towards the back. Each wing is made out of three almost identical shapes, connected in a few places (**Fig.19 – 19c**).

Fig 19

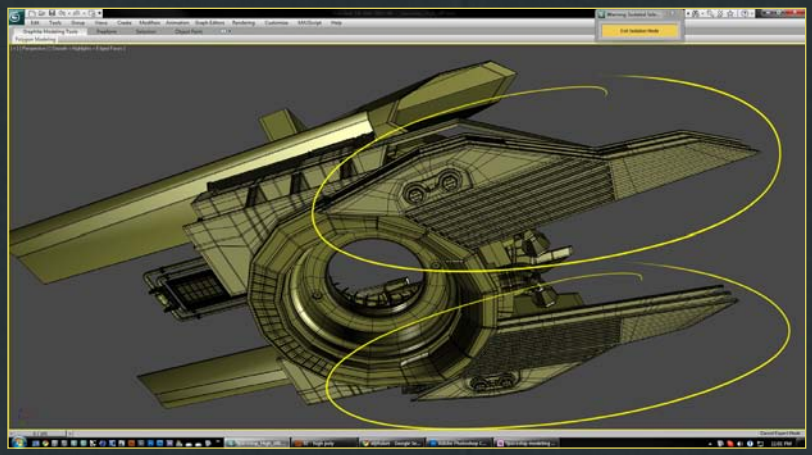
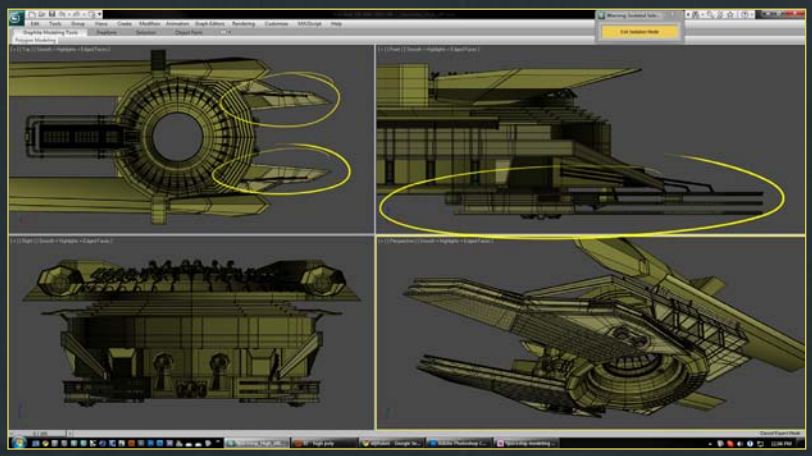


Fig 19a



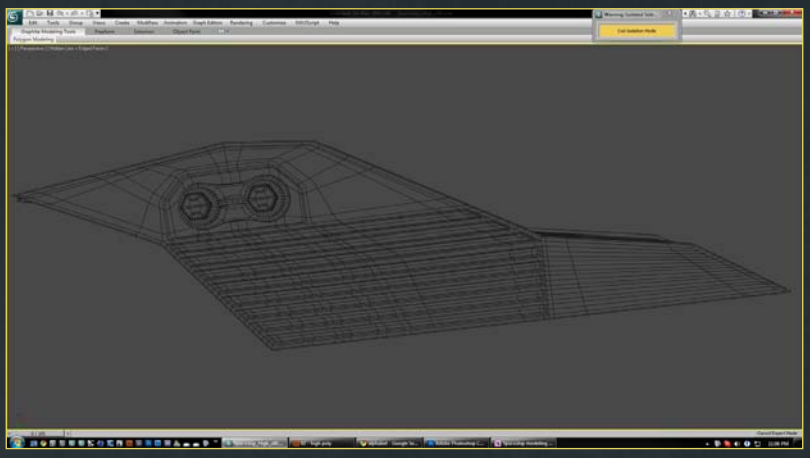


Fig 19b

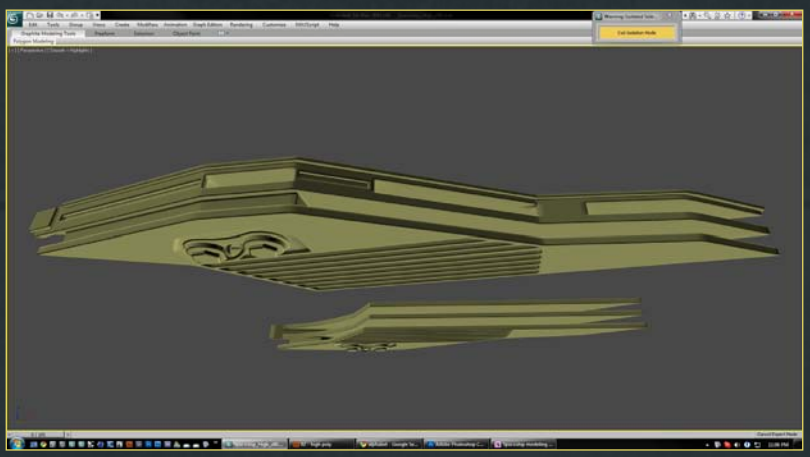


Fig 19c

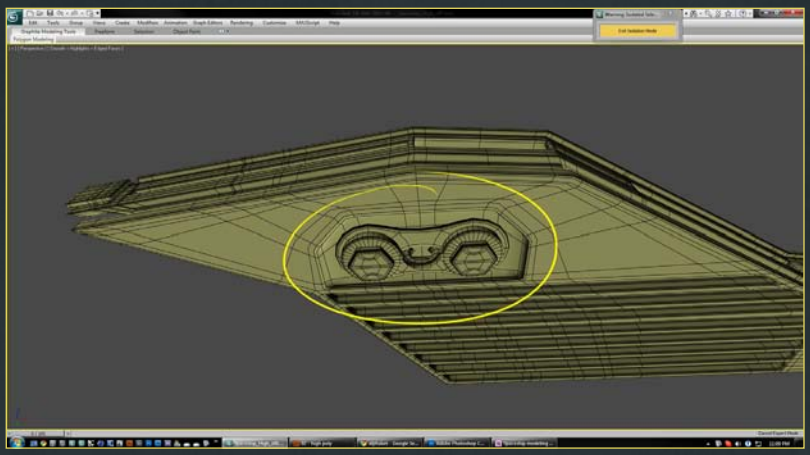


Fig 19d

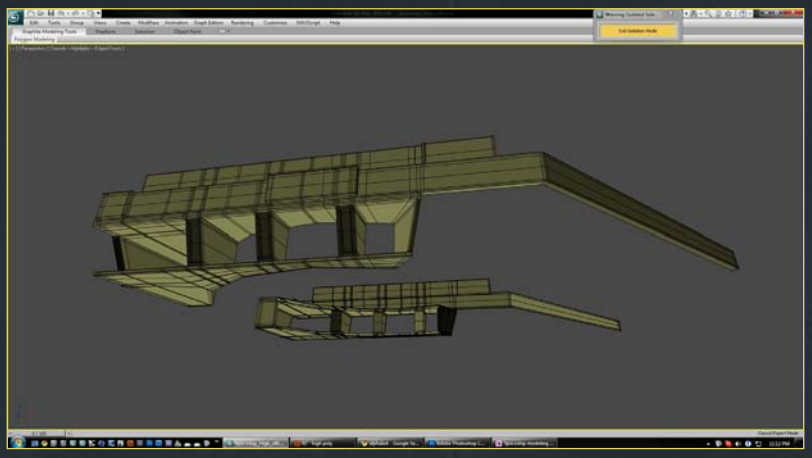
At the bottom there's the element we have already used on the nose of the ship (**Fig.19d**).



Fig 19e

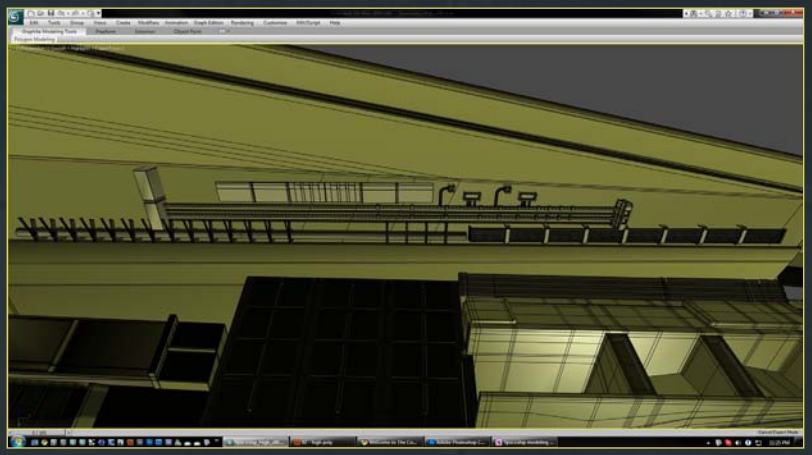
Finally we need to add some structures to the side of the engine (Fig.**19e – 19f**).

Fig 19f



For the end I added some more details below the wings (**Fig.19g**). For me this was enough for the modeling part. You can of course go further and play with the overall shape, change the design of certain parts or add more details to the ship if you wish.

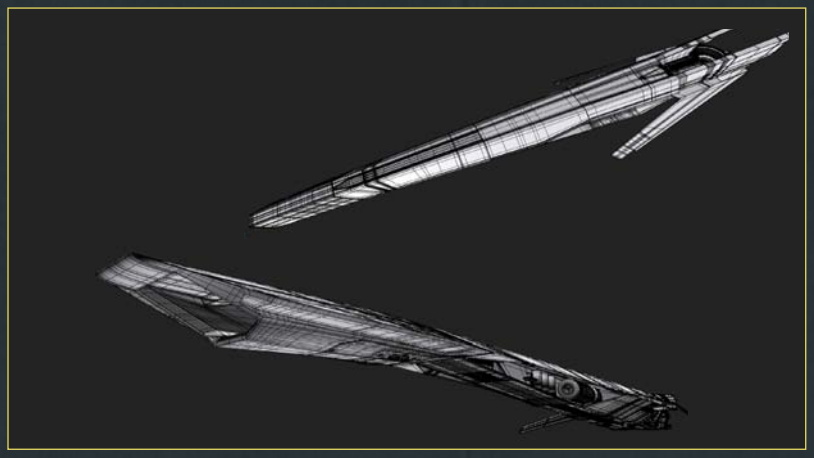
Fig 19g



So at the end you should have something like this (**Fig.20 – 20b**). In the next chapter we'll move on to unwrapping the whole thing and preparing it for texturing.

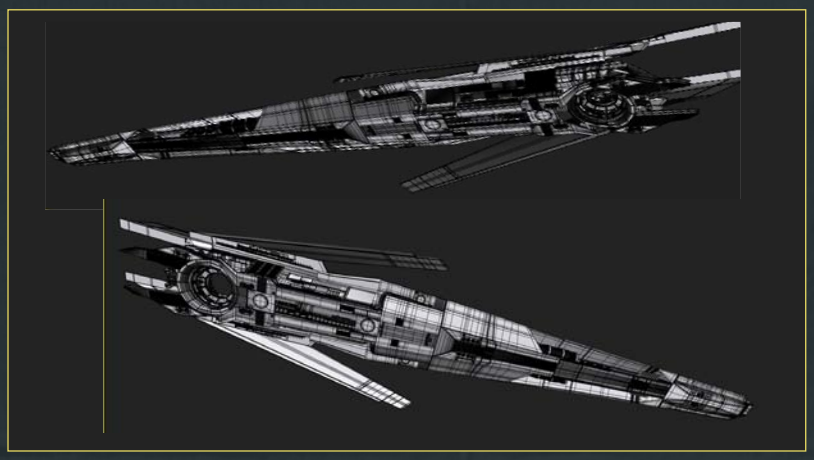
I hope you managed to learn something from this chapter. Remember that experimenting and having fun while learning new tools and techniques is the key to success.

Fig 20



DJORDJIE JOVANOVIC
For more from this artist visit:
http://djordjejovanovic.com/
Or contact:
o6412o2o2o@gmail.com

Fig 20a



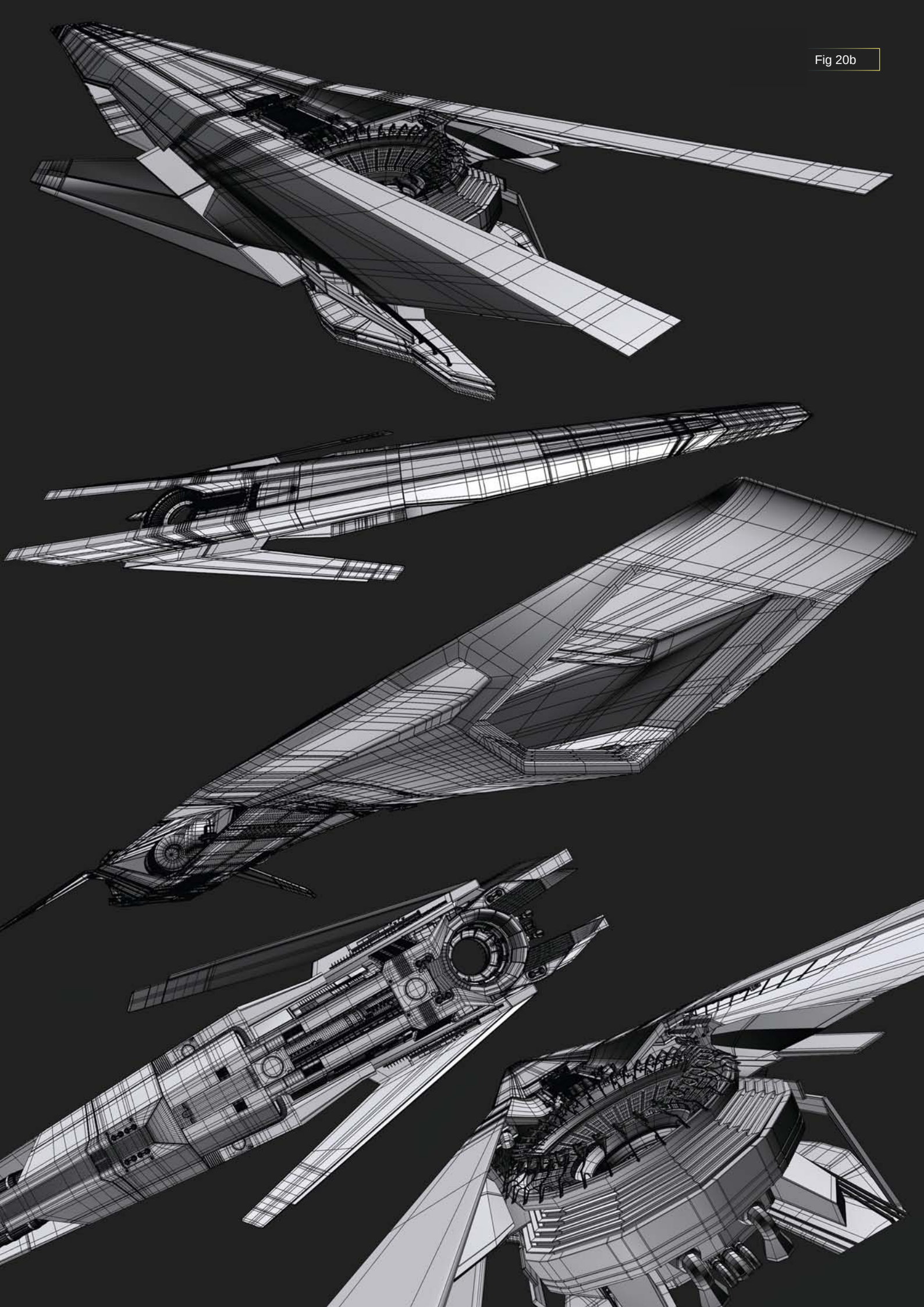


Fig 20b

CREATING THE CELERITAS

SPACESHIP MODELING & TEXTURING



CHAPTER 1 | NOVEMBER ISSUE 063
Concept

CHAPTER 2 | DECEMBER ISSUE 064
Modeling the Low-Poly Version

CHAPTER 3 | THIS ISSUE
Modeling the High-Poly Version

CHAPTER 4 | FEBRUARY ISSUE 066
Mapping and Unwrapping

CHAPTER 5 | MARCH ISSUE 067
Texturing

CHAPTER 3 - MODELING THE HIGH-POLY VERSION

In this fascinating tutorial series our artists will be guiding us through the creation of a complete spaceship in a scene, from beginning to end. We begin the series in Photoshop, using some of its excellent features to help create a concept, a vital process for anyone hoping to come up with an original design. That design is then passed on to our team of modelers who cover the stages of low and high poly modeling, texturing and post-production. This series is filled with tips to help during all of the stages leading up to the creation of an amazing sci-fi scene with an original spaceship.

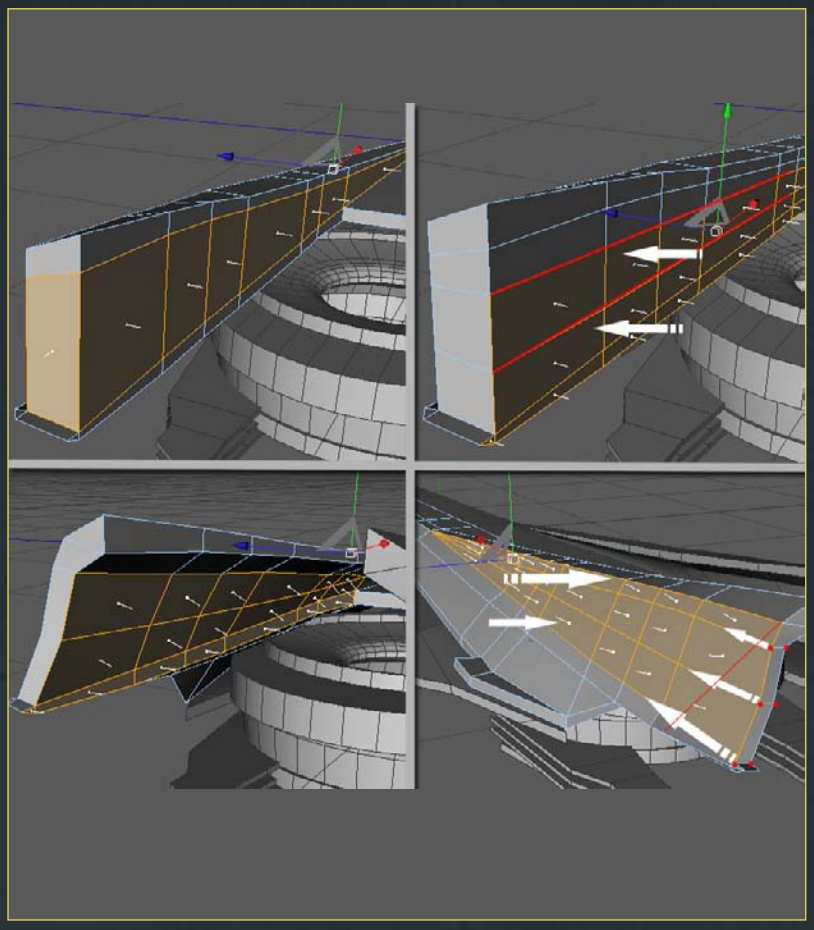
CREATING THE CELERITAS CHAPTER 3 - MODELING THE HIGH-POLY VERSION

Software used: Cinema 4D

INTRODUCTION

I hope that nobody has forgotten the basic steps! Open C4D and choose the Modeling layout. Let's do a simple practice, so we can remember what we have done in the last chapter. Select the inside region of the ship's back and cut a pair of edges. Select this loop and move it, as you see in **Fig.01**. On the top of these parts do the same again. Select the end points of this area, and move those as shown in the image. By doing this we can create the correct shape of the ship's back.

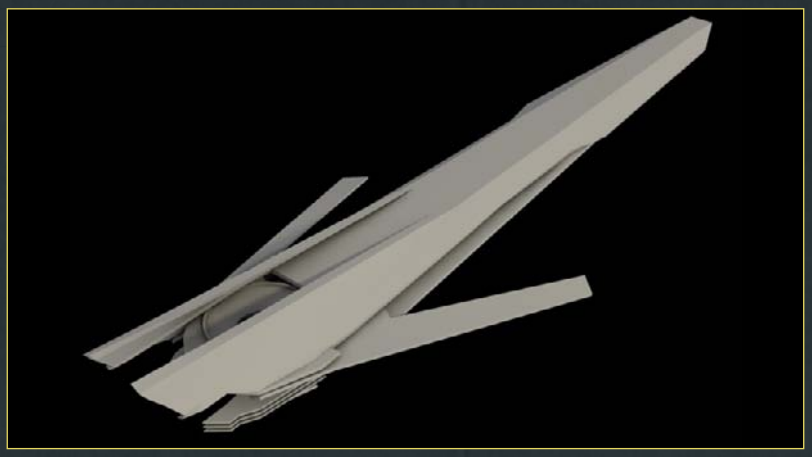
Fig 01



DETAILED CREATION

Now that we have a naked ship surface we need to start adding details. The details are the most important parts of the spaceship. These details and the AO will help to create the look we're aiming for. By adding details we can also help to define the size and function of the ship (**Fig.02**).

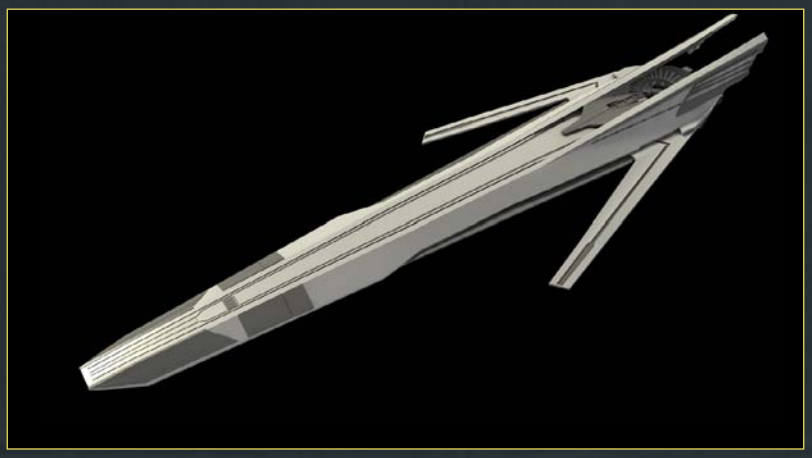
Fig 02



Let's start with the larger elements. To add the details it is very important that we focus on the concept sketch. Once we have created the larger features we detail it by extruding surfaces. We are aiming for is something like this (**Fig.03**).

The spaceship has more elements that we can talk about but I'll show you how you can create some of the important ones. Let's start with an easy one. Take a cube and make it flatter in the Y axis. Select the four corners in Edge Selection mode and use the Bevel tool in Convex Interpolation mode to make a flat shape. This will give us a smoothed plane surface.

Fig 03



Switch to Polygon mode and push Ctrl + A (Select All). Once you have everything selected, use the Smooth Shift tool to get a fully smoothed surface. This is the tool that we use to make Edge Breaks. Edge Breaks are very

important because the size of the edge break demonstrates the size of the ship. So we always need to break the edges!

NOTE: If we want to smooth just one loop then we can use a different method. Select this loop by using the Loop Selection tool in Edge mode and then use Bevel. I've chosen to use the Smooth Shift tool because it is more useful when dealing with 3D objects.

After following the above steps, duplicate the base plate and make it smaller. Duplicate this small plate twice more and place the plates as shown in **Fig.04**. By doing this we get a trapezium shape. These are very simple steps that we can use to add detail to the ship.

Let's move on to the wings. The top holes and shapes will be created in the same way. Let's look at how we can create detail on these larger elements. We're going to start by adding the inside holes of the wings. Select the wing and using the Knife tool in Loop mode, cut a pair of loops.

As you can see, the loop line is not the same as the concept. So select the loop downer points in Point mode and move them into the right position. After you've done this, cut a new pair of loops for the front of the wing.

This is needed because we want to make a wider region in the front of the wings. Select the crossing points and make it wider. If you wanted to you could use the Extrude tool or the Edge Breaks again to do this (**Fig.05**).

Ok, let's look at how to create an array object. This is also very simple. Inside the ring create the simple object that you want to repeat. Then draw around the object that you want to array.

Go into Cube C mode and select the down point and move it. Click on the icon that is shown in **Fig.06** and this will create the array object for you. It has many parametrical counts.

Fig 04

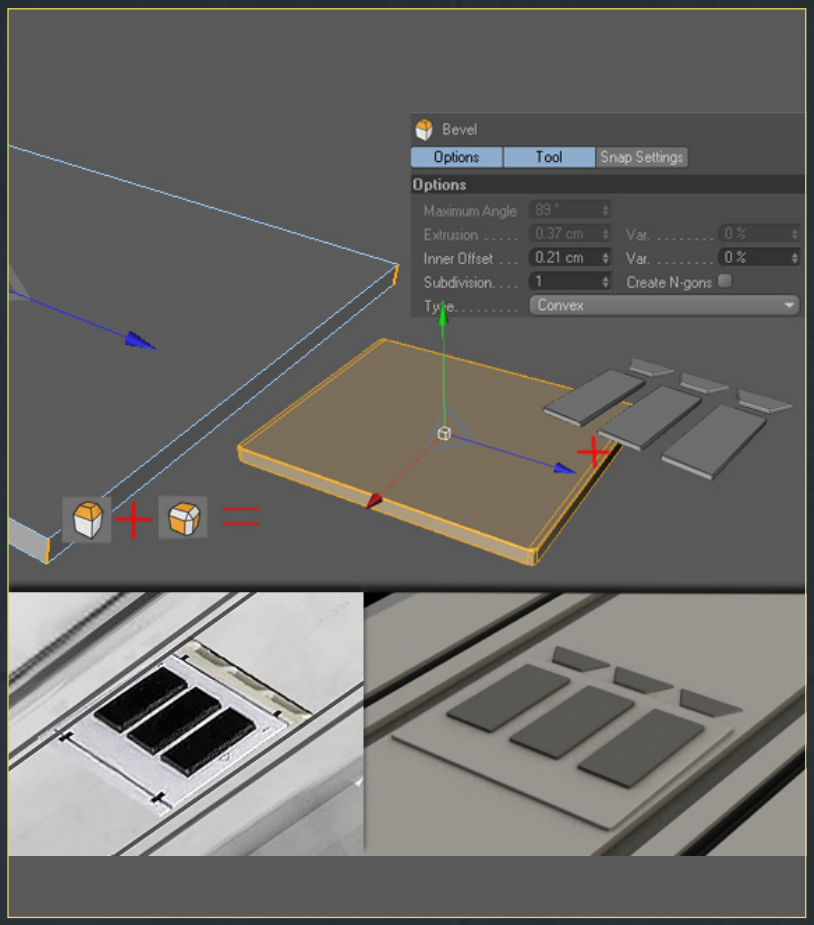
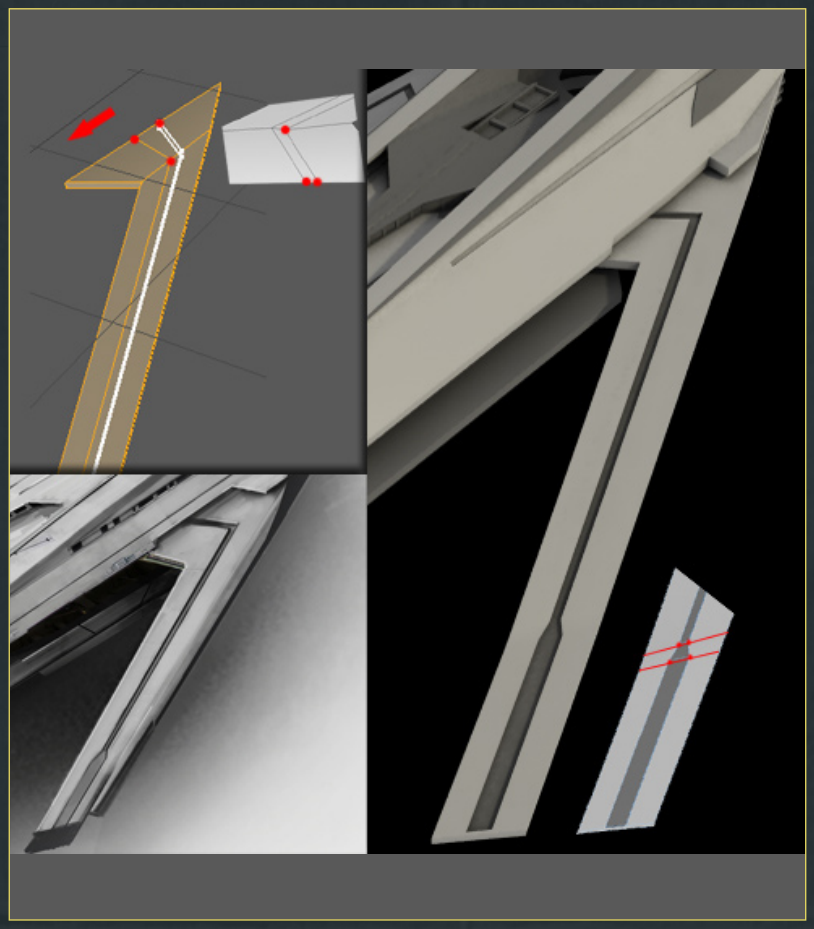


Fig 05



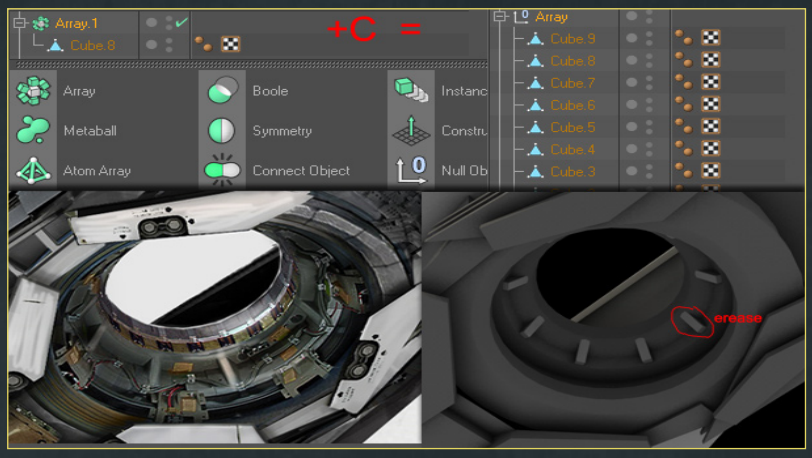


Fig 06

Radius and copies are what we need. In Object Manager, move the cube to the array.

After doing this you can see that cubes are appearing around the centre of the array object and the basic cube is hidden. If you want to deform the base elements, you can do this in the hidden object.

There might be a problem where the array clones are not in the same position/direction as the basic cube.

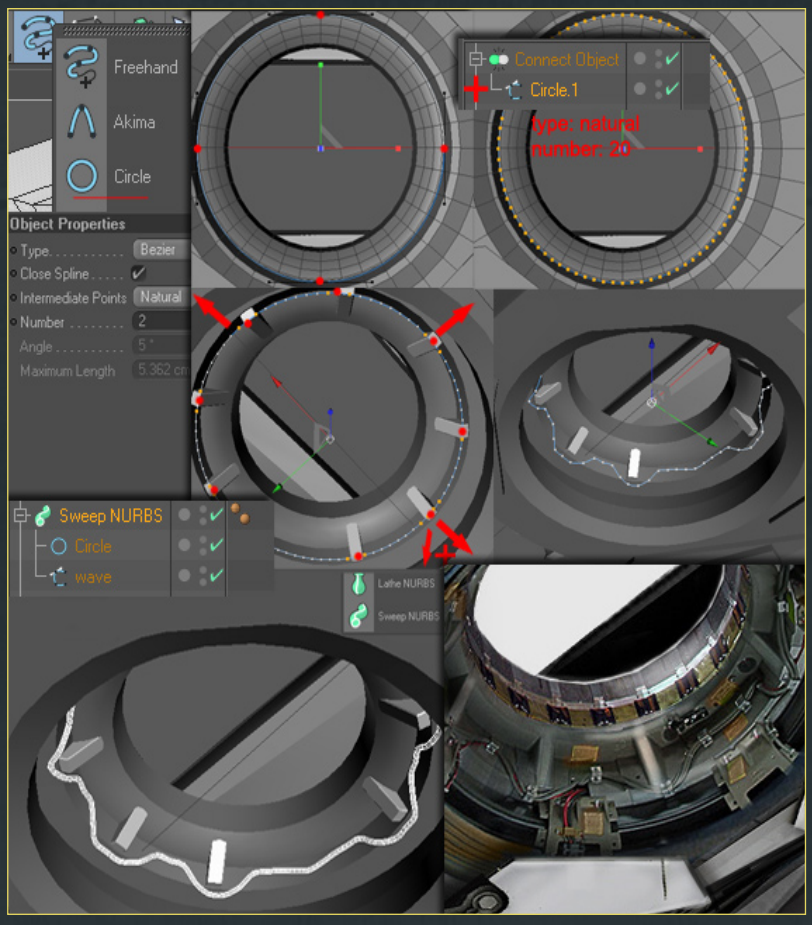


Fig 07

No problem. Just click Hide Mesh, switch to the Object Axis tool, and in Coordinate Manager you can rotate the Pivot. By doing this you can fix the position of the clones.

Once you've fixed everything, move the central pivot of the array to the required place. The clones will now be steady.

If you want to deform these copies, just push "C". Now all the copies are in one single mesh inside the array group (**Fig.06**).

Okay now let's see how we can make a tube. Select a circle shape from the basic spline objects.

Move the ring into the right position. The ring has lots of parametrical counts. We can add more sub points and we can also change the direction and intermediate points etc.

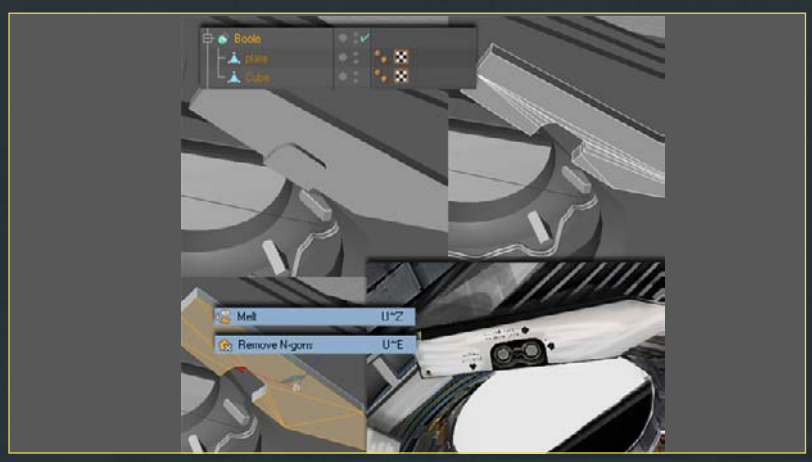


Fig 08

Set the Int.Point type to Natural and the Division Count of the ring to 10.

After that, open a Connection Object operation and move the circle inside and push "C". Now it will seem like nothing has happened so switch to Point mode. Now we can see that the circle has many points.

Select the points where the wire will be attached to the wall of the circle. Click with the right mouse button and select the Soft Interpolation

command to make the line smooth again. After this, create a new circle shape. Again set its Int. Point to Natural and the Division Count to 2.

Then add a Sweep object from the commands. Place the circle and the wave line inside the sweep NURB object. Now if everything is correct we get a big cloud shape.

Reduce the scale of the circle shape and it will make a tube. By adjusting the scale you can create any type of tube you like. Once you're happy with the shape, push "C" and it will become an editable mesh. (A possible problem here is that the shape doesn't look like we want it do. The reason for this is that the circle pivot is in the wrong direction. You can change this in the circle's attributes) (**Fig.07**).

Here's an example of how we can do a Boolean operation. Go to the lower ring cover plate and draw the shape that we want to cut out. You will need to use a cube and Bevel tool in Edge mode. Repeat the steps that we have done before to create the other elements.

In the Object Manager take the plate object (cutted) and the cube object (cutter) inside the Boolean and you should immediately see the outcome.

The Boolean operation is working in real-time so we can see differences straight away. This is good because if too many edges are meeting closely then the surface looks broken and it's harder to fix the wire frame once you've finished.

The problem in Boolean is that it can create a mess when making the wire. Fortunately we have two very nice tools: the Melt and the Remove N-gons.

The Melt tool clears all the edges inside the selected region and the other connects the points in the best way (maximum quadpoly). Of course, the best way is to do it by hand using the Knife tool (**Fig.08**).

Fig 09

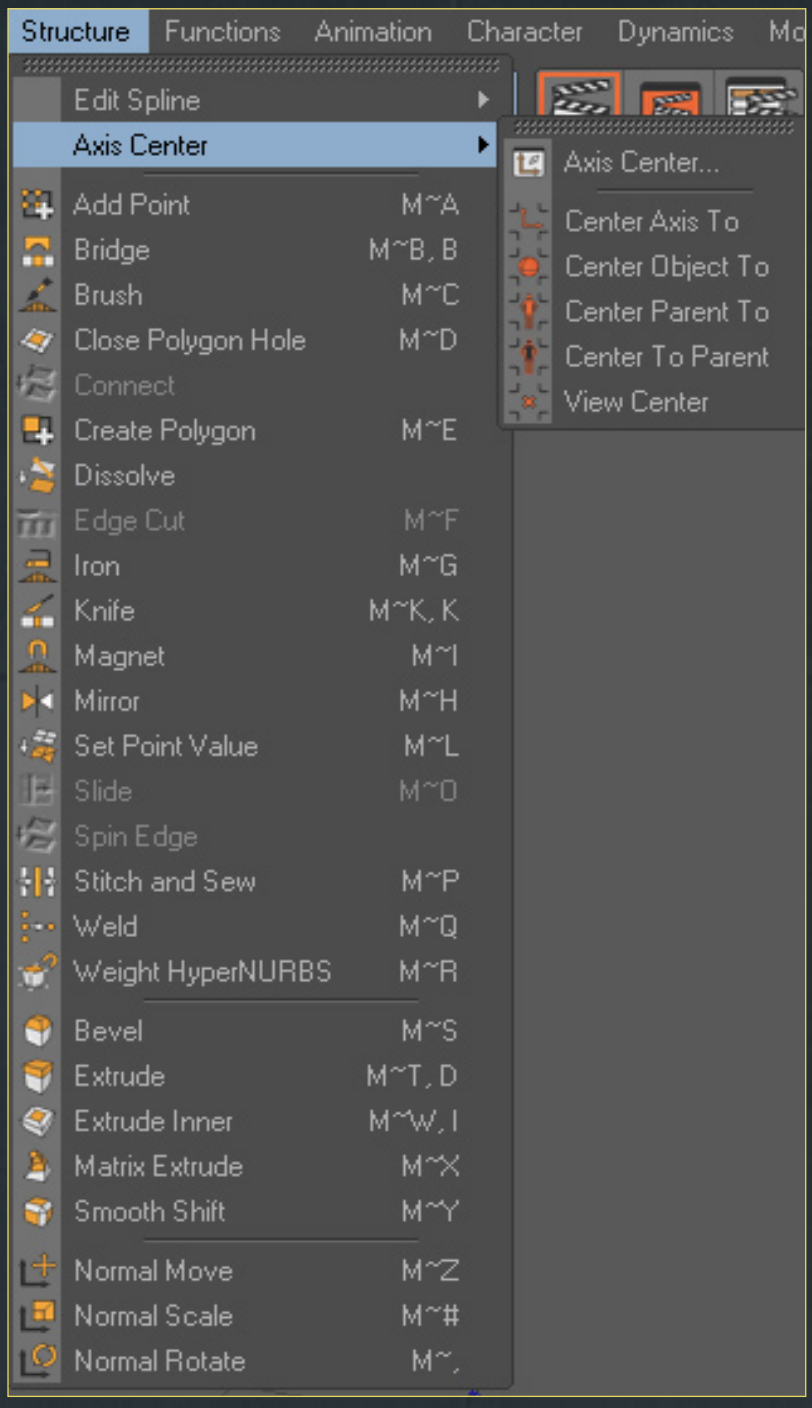


Fig 10



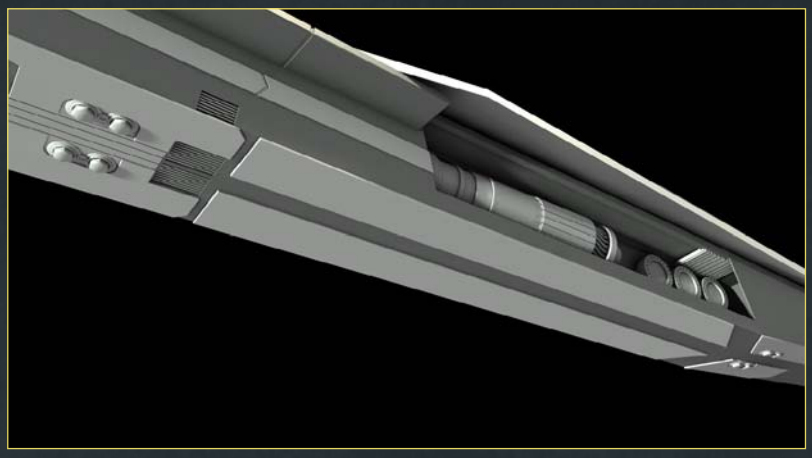


Fig 11

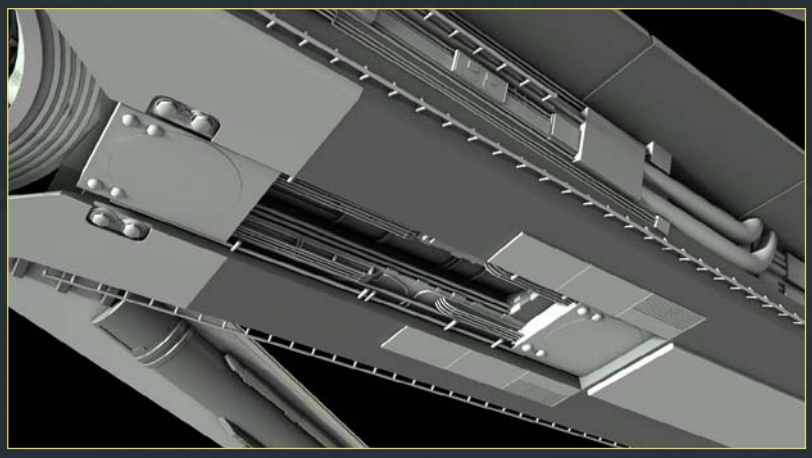


Fig 12

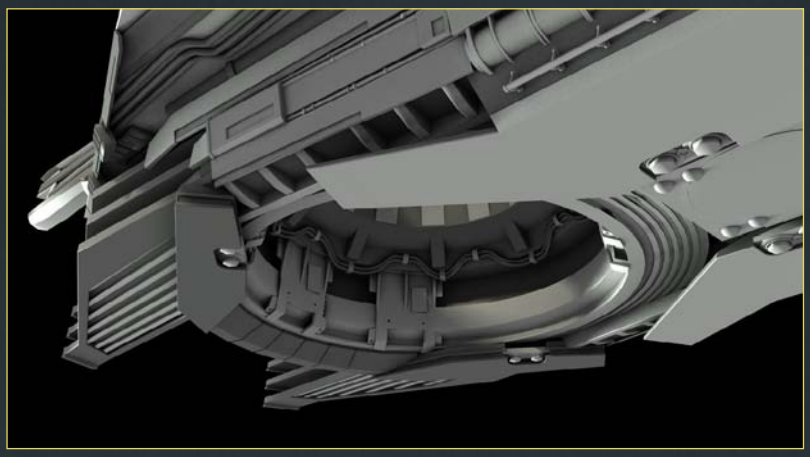


Fig 13



Fig 14

Cinema 4D offers more tools and functions beyond the ones I've mentioned so far. Let's look at some of them. The Structure menu has all the tools that we can use in Modeling mode. Another important function is the Axis Centre tool panel.

There we can fix the seams at the center of our meshes or move the object to the pivot place.

It is a very good tool because after a connection or Boolean command etc, the pivot will be in the center of the scene, not the object. By using the Axis Centre tool we can fix this. A wrongly placed pivot makes life hard because the Rotation, Scale and Move are working in the pivot's direction. If you want to rig the ship then a wrong pivot is a nightmare.

I'd like to mention the other tools (**Fig.09**):

- The Brush: by using this tool we can sculpt the polygons, one by one. It also has many parameters which can allow different types of transformations.

- Close Polygon Holes: we can use this tool to close the holes on the mesh surfaces. It causes no fixed edges.

- Iron: this tool pushes on the entire surface. Using this tool is good when making a car.

- Set Point Value: this tool can move the points, edges and faces in the same dimension. This is good when we want a perfect border for symmetry.

I think I've shown all kind of tools and modeling types in this chapter which will allow us to successfully build up a mass of details. Now, let's see some of these details on the ship's surface (**Fig.10 – 15**).

I hope this has been helpful so you will know what to do when detailing a model (**Fig16**). In the next chapter, we will look at the easiest way to Map and UVW this ship.

Thank you for reading my tutorial!

TAMÁS GYERMÁN

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Or contact:
tamas.gyerman@gmail.com

Fig 15



Fig 16





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ONLINE

CREATING THE CELERITAS

SPACESHIP MODELING & TEXTURING



Chapter 1 | November Issue 063
Concept

Chapter 2 | December Issue 064
Modeling the Low-Poly Version

Chapter 3 | This Issue
Modeling the High-Poly Version

Chapter 4 | February Issue 066
Mapping and Unwrapping

Chapter 5 | March Issue 067
Texturing

Chapter 3 - Modeling the High-Poly Version

In this fascinating tutorial series our artists will be guiding us through the creation of a complete spaceship in a scene, from beginning to end. We begin the series in Photoshop, using some of its excellent features to help create a concept, a vital process for anyone hoping to come up with an original design. That design is then passed on to our team of modelers who cover the stages of low and high poly modeling, texturing and post-production. This series is filled with tips to help during all of the stages leading up to the creation of an amazing sci-fi scene with an original spaceship.

CREATING THE CELERITAS CHAPTER 3 - MODELING THE HIGH-POLY VERSION

Software used: Maya

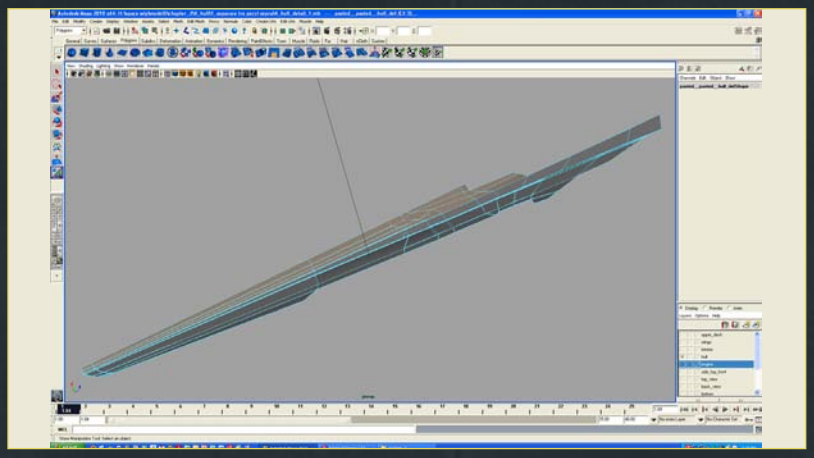
DETAILING

By the end of the last chapter we had obtained a good base mesh. It's now time to add the detail.

THE HULL

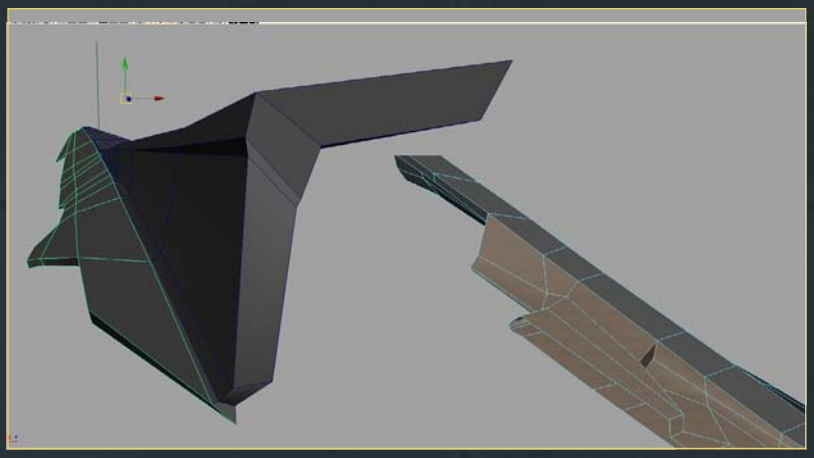
The first thing to do is split the hull into three different parts, in order to get better control over the mesh. Select the hull as seen in **Fig.01** and choose Mesh > Extract. This way you'll manage to add detail to each part without adding pointless loops to the existing parts.

Fig 01



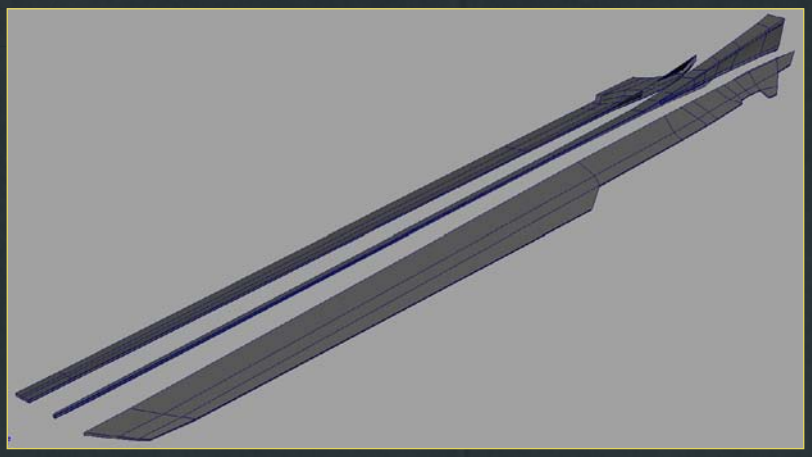
Repeat the same operation for the other two parts, as shown in **Fig.02**, and you'll finally create three separated parts of the hull.

Fig 02



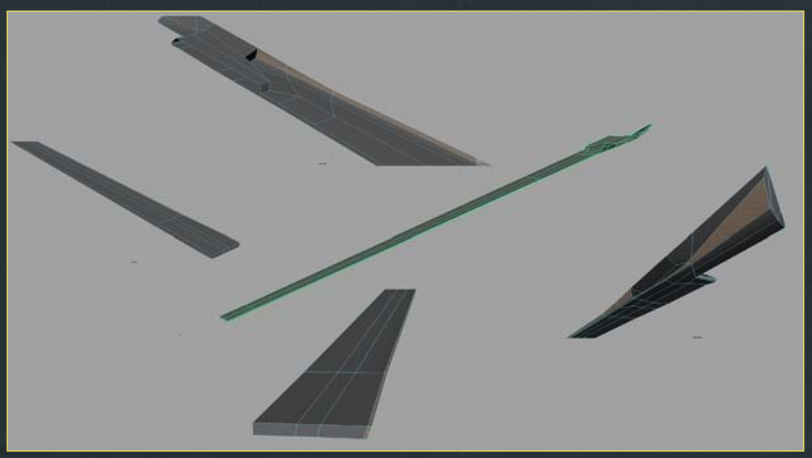
Here you can see the main deck, the fins and the side hull (**Fig.03**).

Fig 03



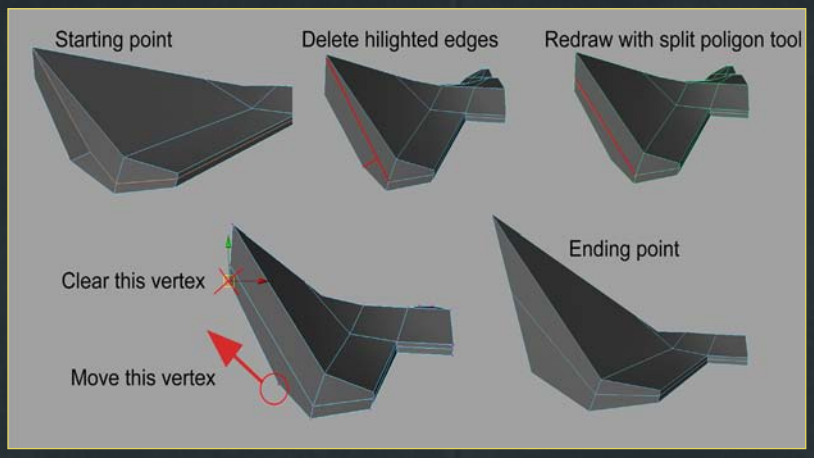
Once you have created the three parts you will then have to refine them. Firstly let's clean up the deck. To do this select the loop of faces shown in **Fig.04** and clear them.

Fig 04



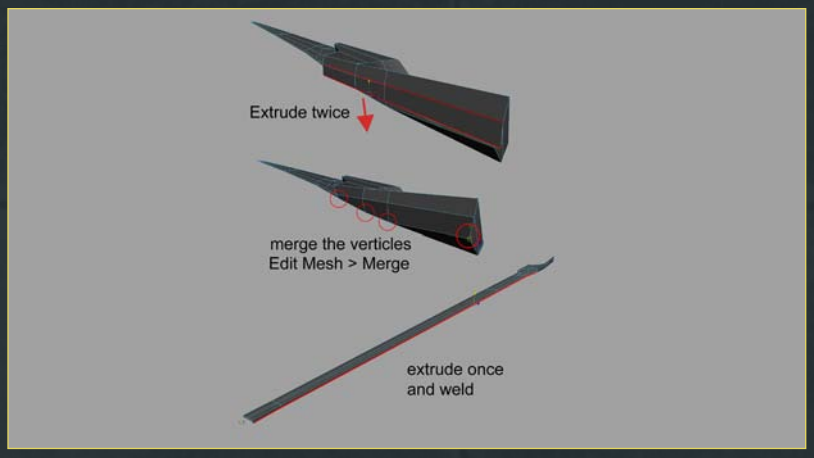
Now, at the back, redraw the hull as seen in **Fig.05**.

Fig 05



Now close the hole in the deck as seen in **Fig.06** and we're done with the deck.

Fig 06



Do the same with the center fin (**Fig.07**) and the side hull (**Fig.08**) and the base detail of the hull is done.

Fig 07

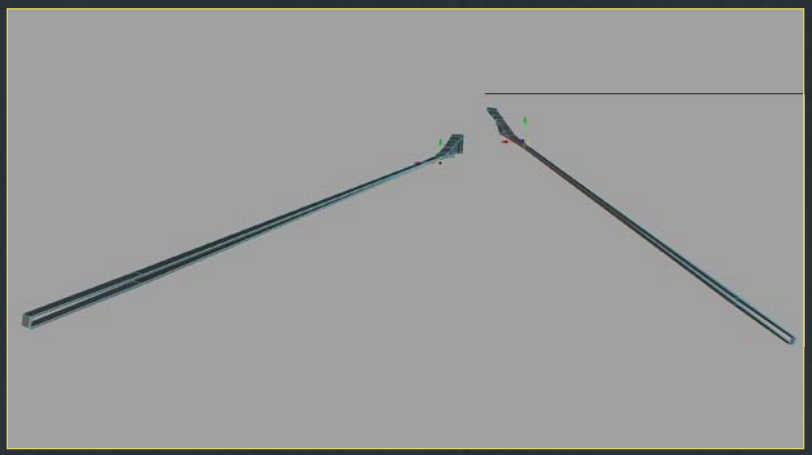
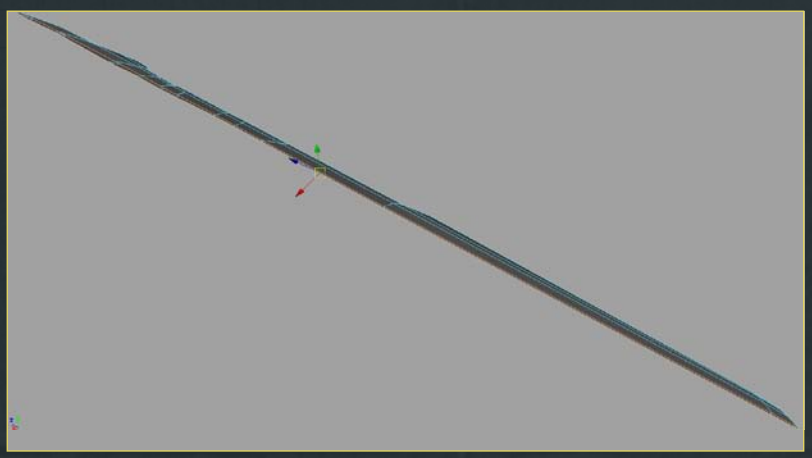


Fig 08



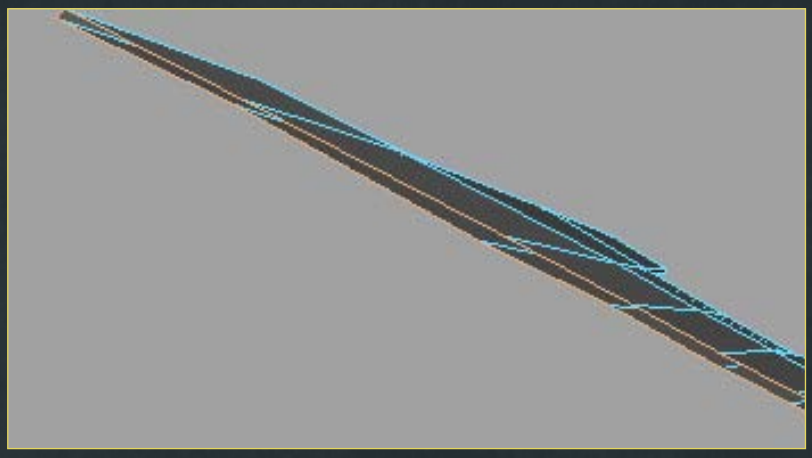


Fig 08b

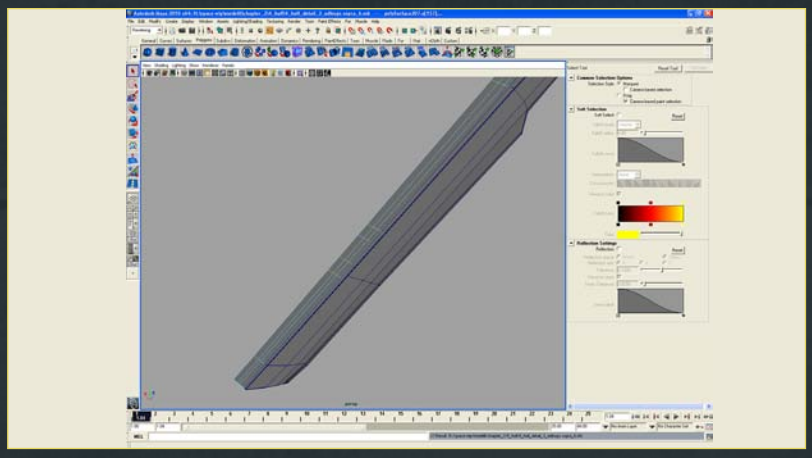


Fig 09

Once you have divided the hull into three parts you can now start detailing the center deck. The first thing we have to do is separate the front elements in order to create a more realistic look. First add four loops (**Fig.09**).

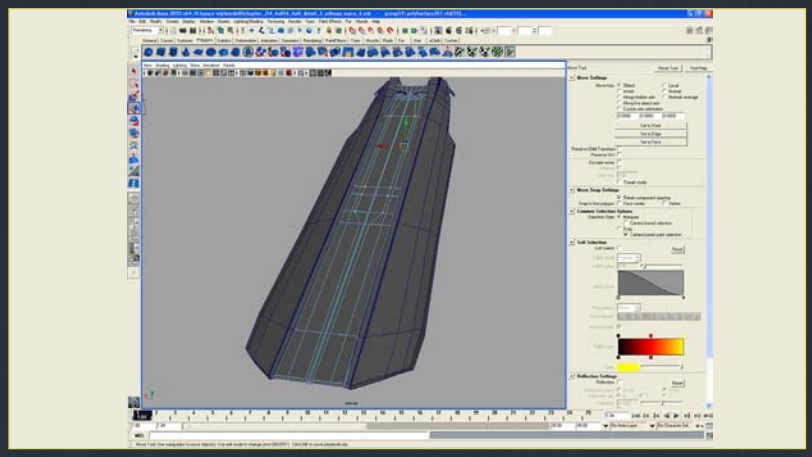


Fig 10

Next move the vertices and you'll make the base shape of the nose's details (**Fig.10**).

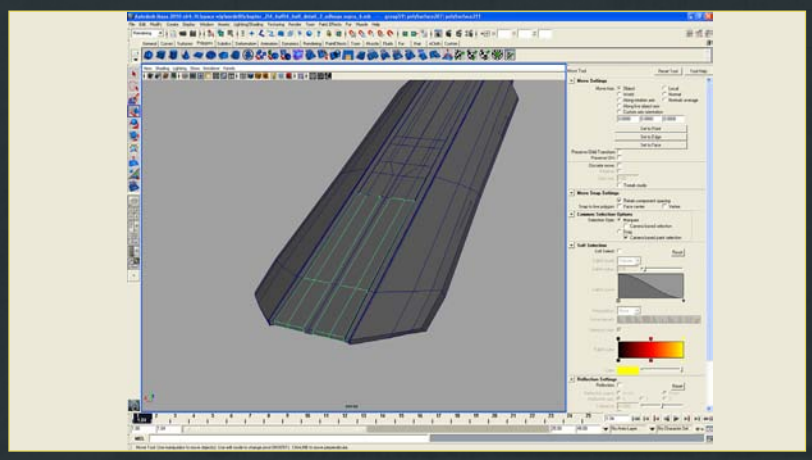
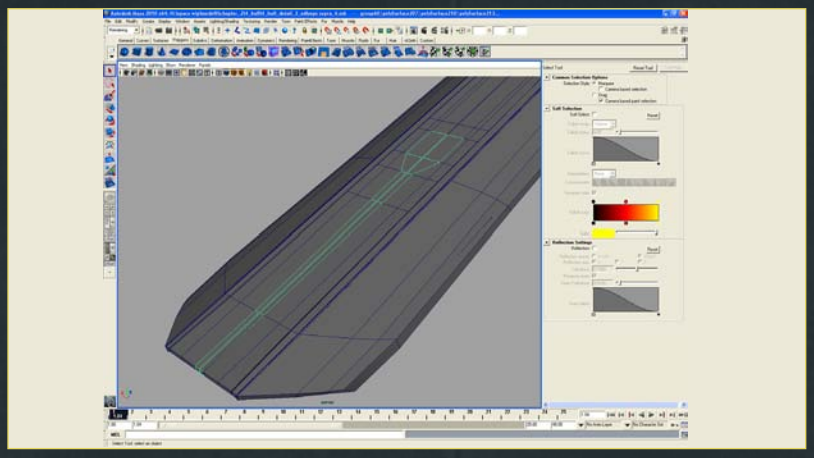


Fig 11

Now select the faces and go to Mesh > Extract (**Fig.11**).

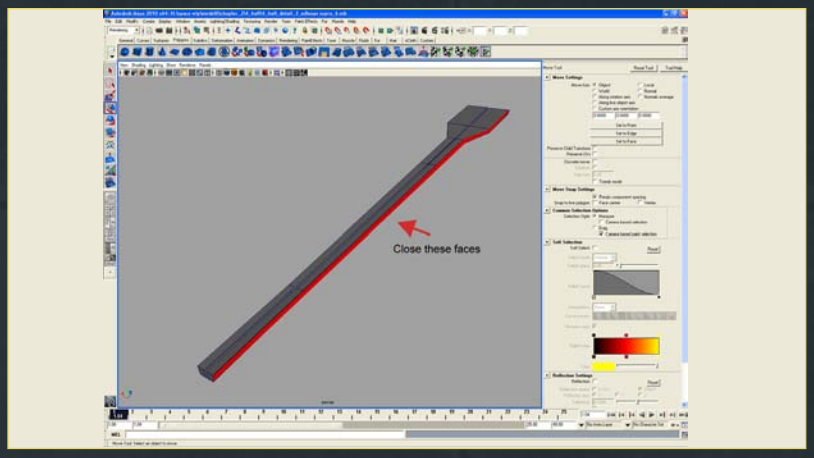
Do the same with the faces of **Fig.12**.

Fig 12



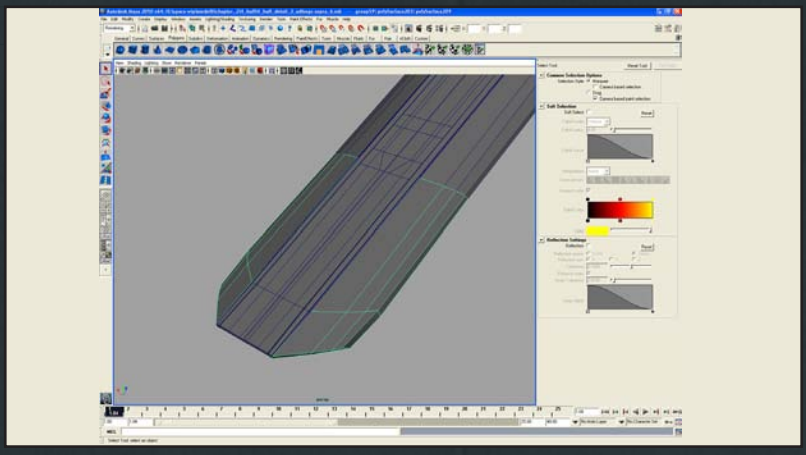
Remember to close the faces left open for all the shapes you'll extract (**Fig.13**).

Fig 13



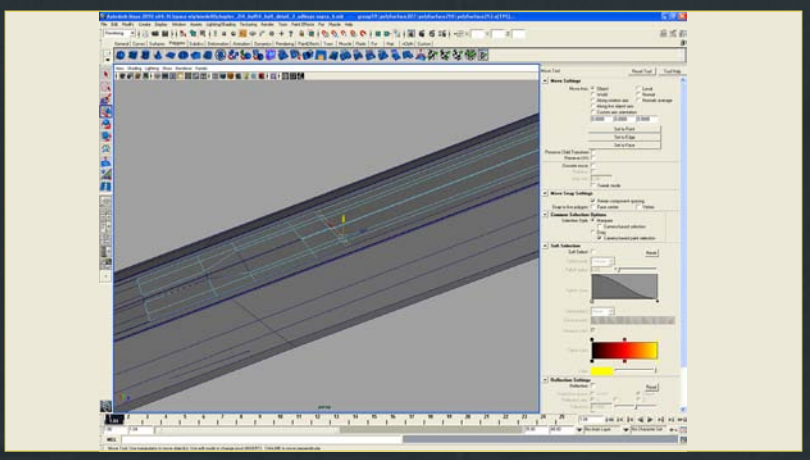
Next extract the side hull faces (**Fig.14**).

Fig 14



Add one more loop and move it down a bit to create the gap in the concept (**Fig.15**).

Fig 15



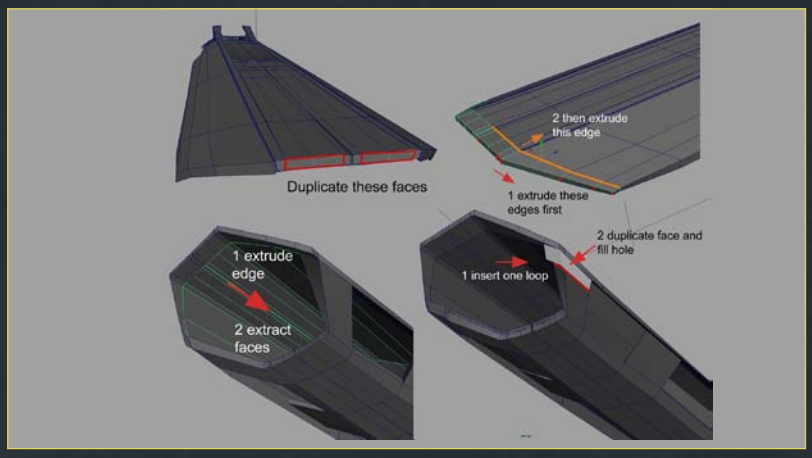


Fig 16

Now we can add the protection for the front nose. Extract the faces indicated in **Fig.16**, then extrude the edges following the shape of the hull. Then create the air intake panels by extruding the lower edges once more and extracting them. Finally create the hull's front reinforcements.

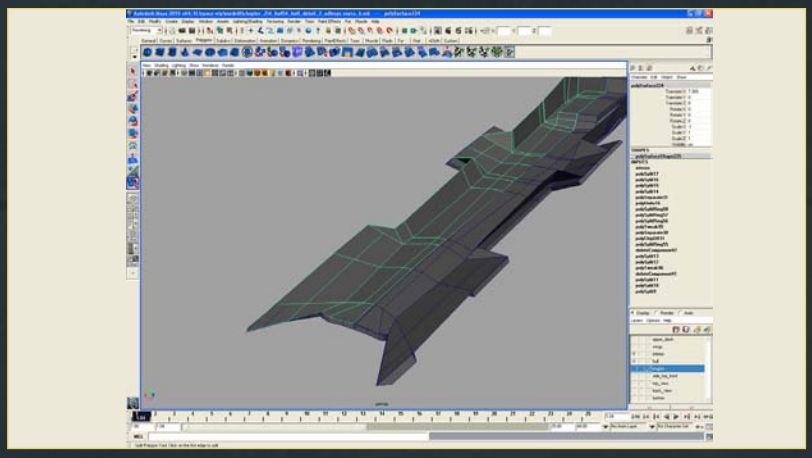


Fig 17

Also the lower hull needs a couple of adjustments. First check the positioning of the interior parts and, if necessary, move the vertices by snapping them (by holding the V key while moving) to the lower hull's exterior (**Fig.17**).

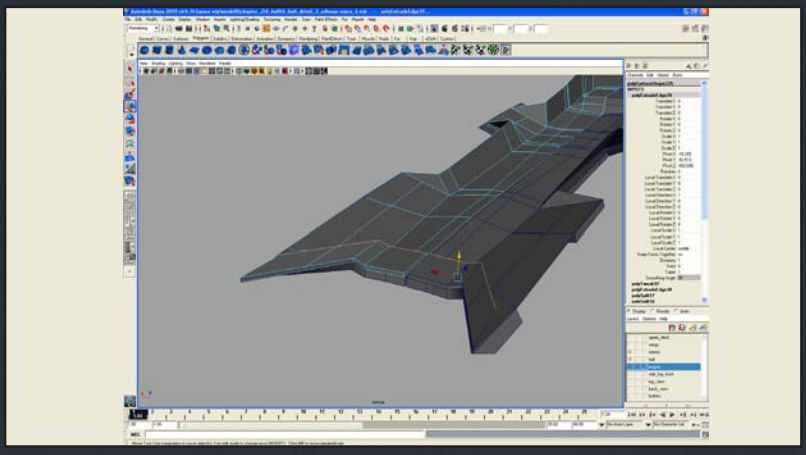


Fig 18

If you want you can add some more loops in order to adjust the shape. Remember that this is just a fill so you can leave it quite rough. It's important to extrude the front edges to create the lower air intakes interior (**Fig.18**).

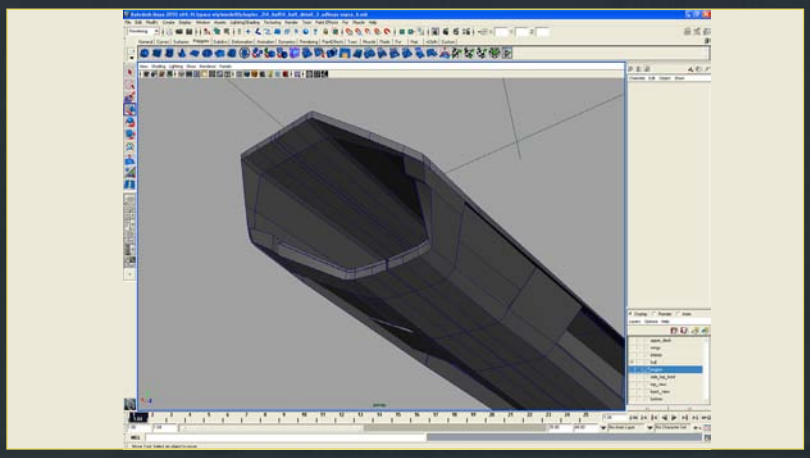
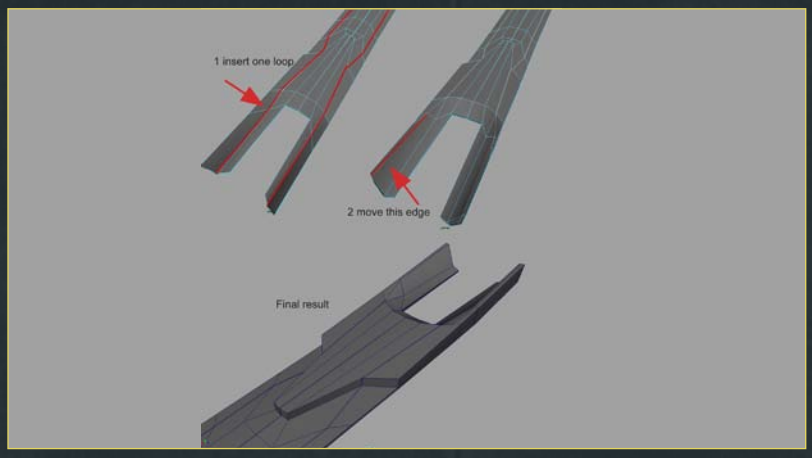


Fig 19

The final result of the nose's fine tuning should look like **Fig.19**.

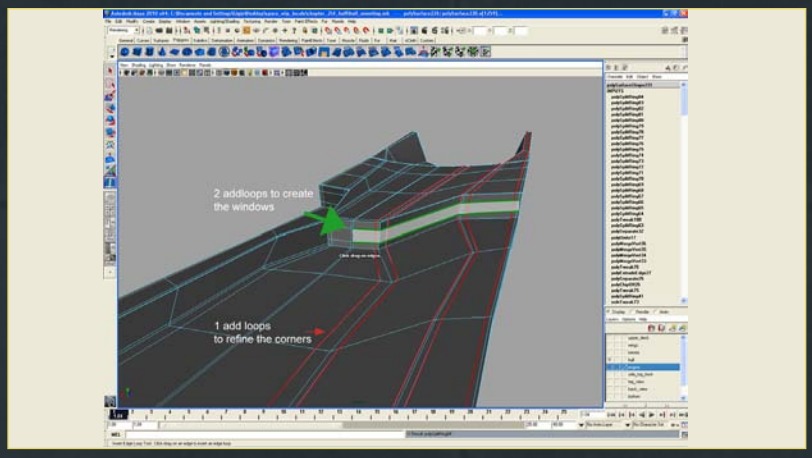
Once you have created a satisfying shape you can start to add loops in order to prepare the mesh for smoothing. Adding loops is an operation that increases the number of vertices and complicates the mesh. As this complicates the mesh you must be sure about the overall shape as future adjustments will be harder to make. One good thing to do is to start making incremental saves. This way you can go back to a previous step if you don't like the results.

Fig 20



The part that requires more care at the moment is the center deck, so we'll start with this. Insert one loop as seen in **Fig.20**, and move the edges at the rear.

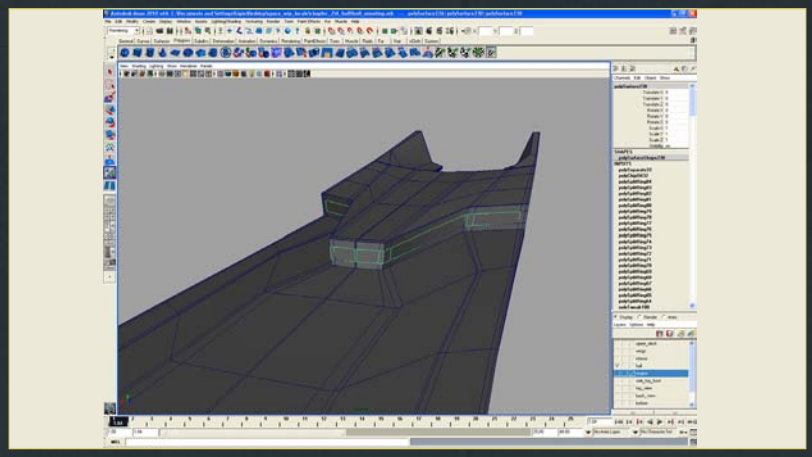
Fig 21



Start refining the deck by adding loops near the corners. To create the deck's windows, add the loops (**Fig.21**).

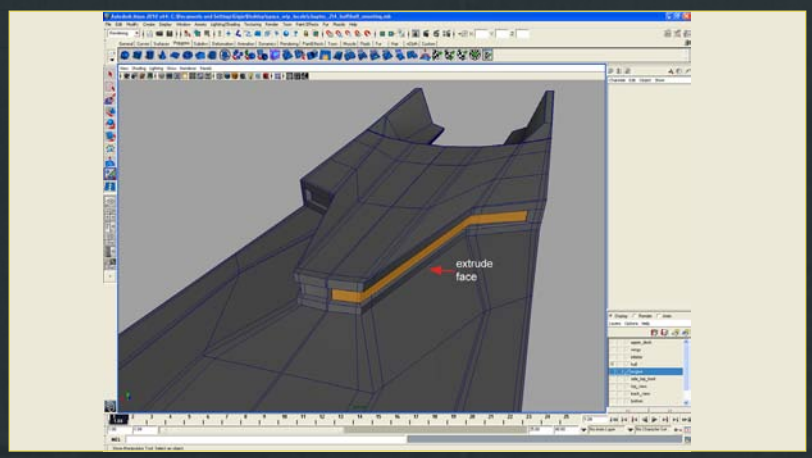
Next duplicate the faces and move them to a different layer. These faces will become the glass (**Fig.22**).

Fig 22



Re-select the faces that you used to create the glass and extrude them inwards (**Fig.23**).

Fig 23



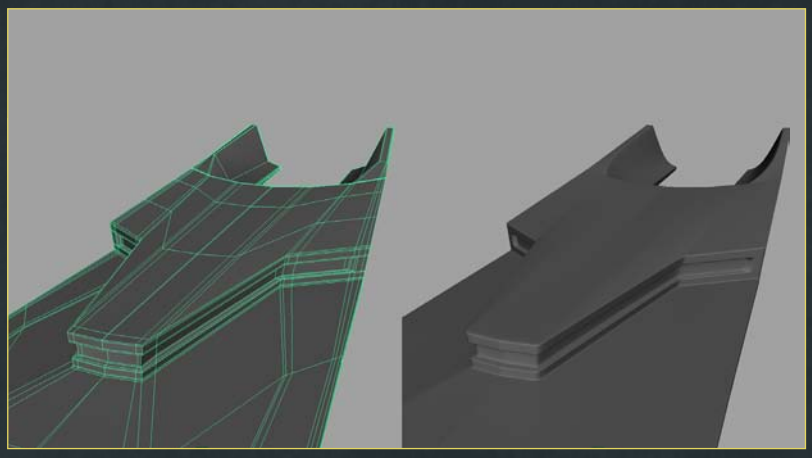


Fig 24

Now if you press the three key you'll switch from the standard non-smoothed mesh preview (that you activate by pressing the 1 key) to the smoothed one. The result will still be quite rough as we have to increase the loops near the mesh's corners to add information for the smoothing engine.

Once you'll have added the loops the result will be different, as you can see in **Fig.24**.

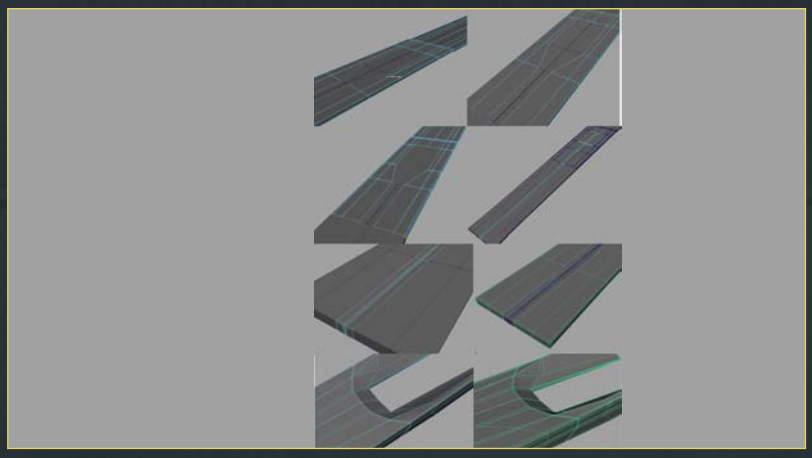


Fig 25

Now in the same way add details to the rest of the deck's features (**Fig.25**).

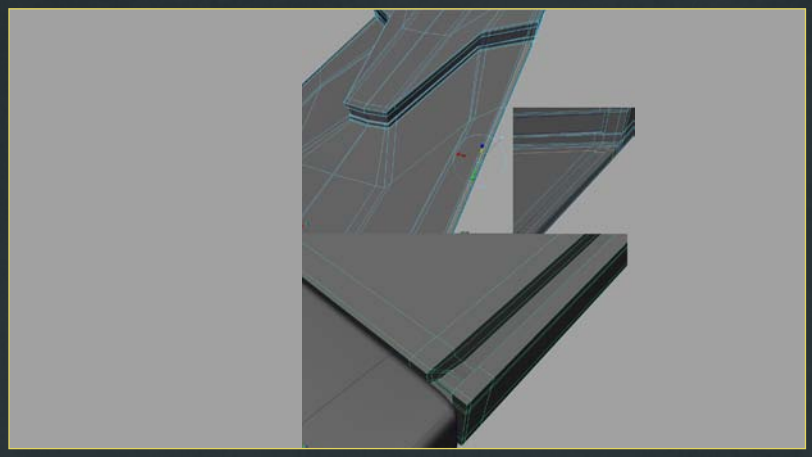


Fig 26

Now it's time to add a detail that should really be added with a shader, but that would look better if you modeled it - particularly if you want to do some close ups: the black rail that runs through the deck. Select the edges from the top of the hull to the shield's position. Extrude and refine them with loops (**Fig.26**).

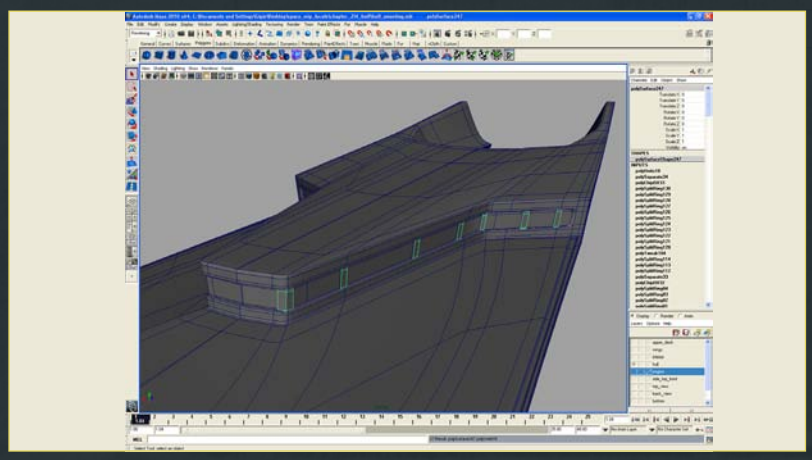
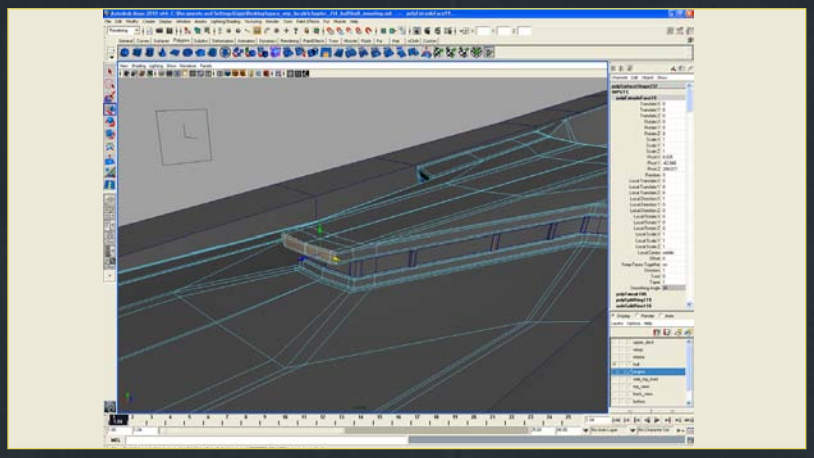


Fig 27

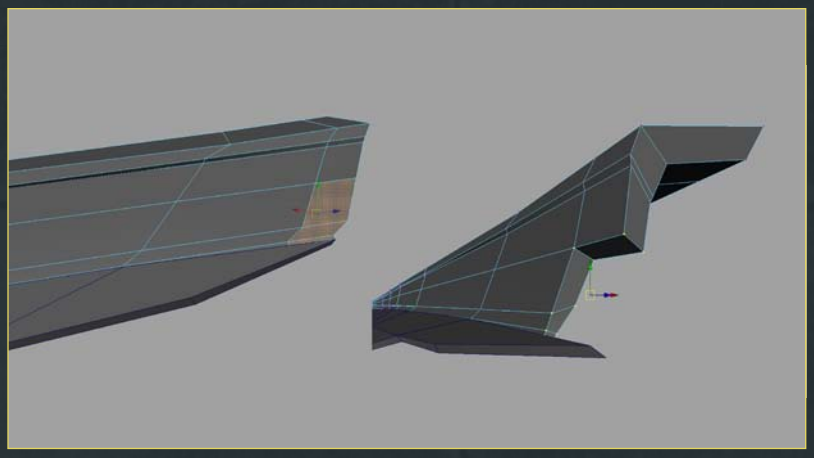
The next detail is the windshield supports that will be duplicated from the mesh of the glass (**Fig.27 – Fig.28**).

Fig 28



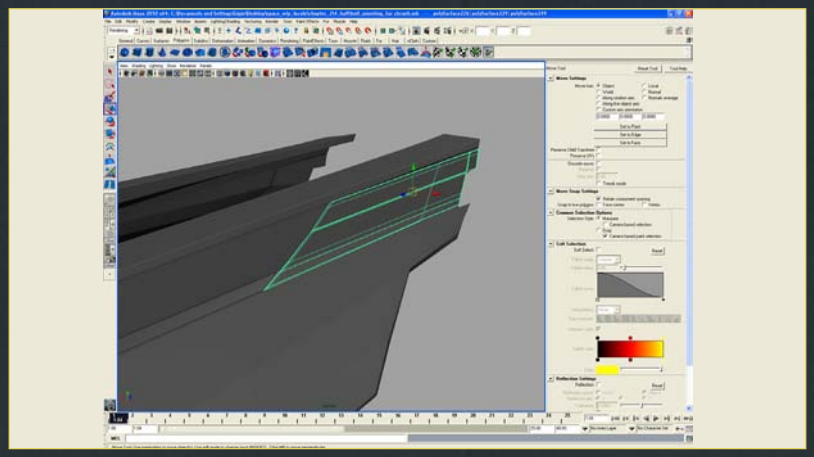
Now that the center deck is done you can move on to the fins. First we have to delete the faces highlighted in **Fig.29** and close the mesh.

Fig 29



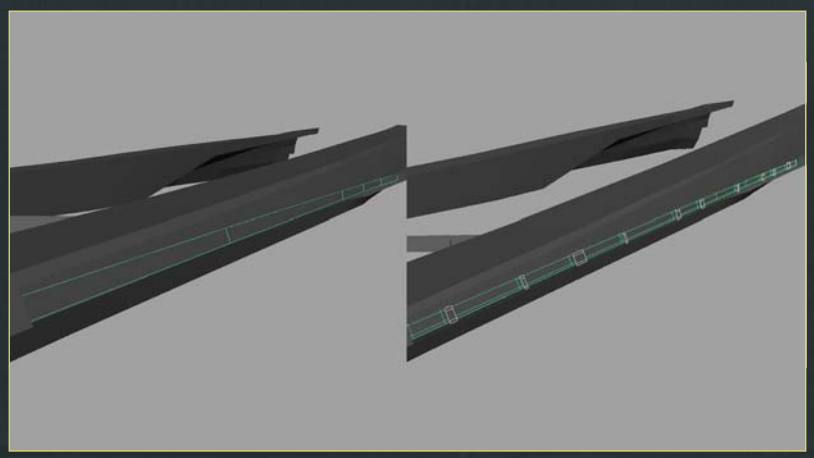
Next create the rear panel with the Duplicate Face command and extrude it (**Fig.30**).

Fig 30



Again, always with Duplicate Face command, create the side windows and their supports (**Fig.31**).

Fig 31



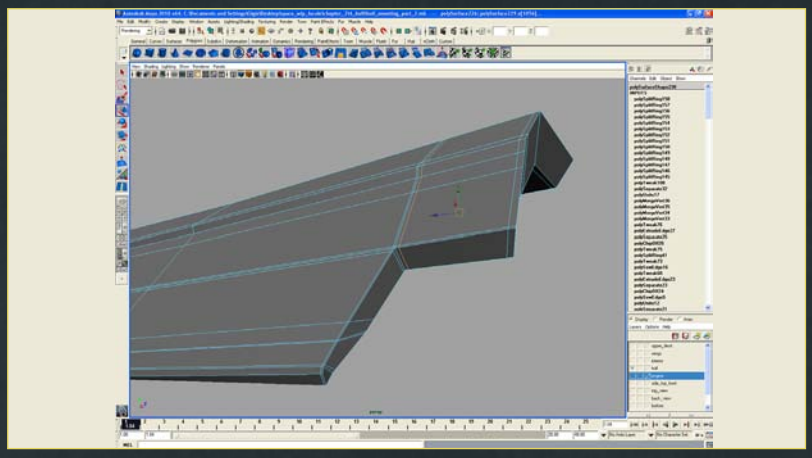


Fig 32

The last thing to do is add the loops to add detail to the smoothed surface, taking care in the most delicate parts, for example the rear fin (**Fig.32**), and the windows section (**Fig.33**).

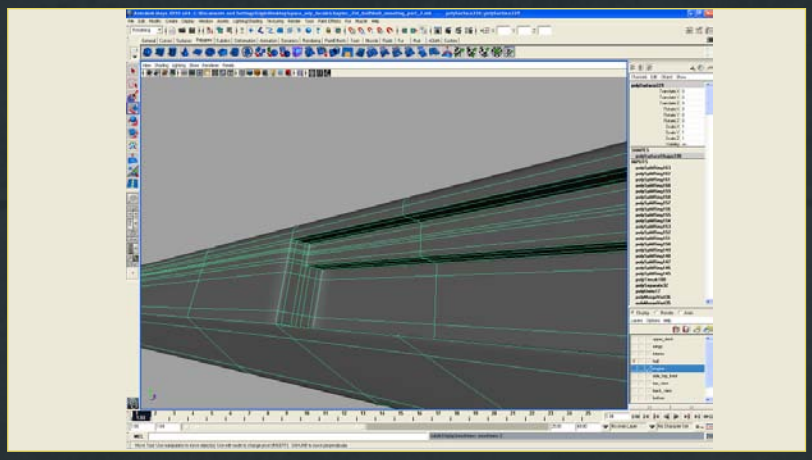


Fig 33

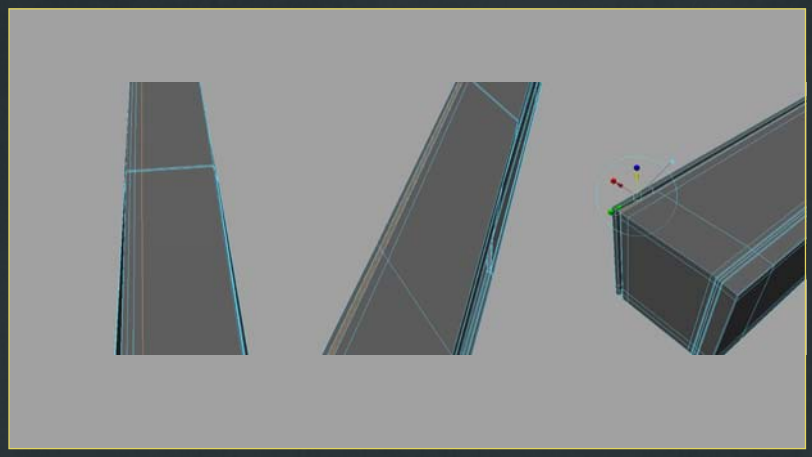


Fig 34

Again it's up to you if to decide to add the second black rail instead of applying a shader. Just add four more loops and extrude the center faces (**Fig.34**).

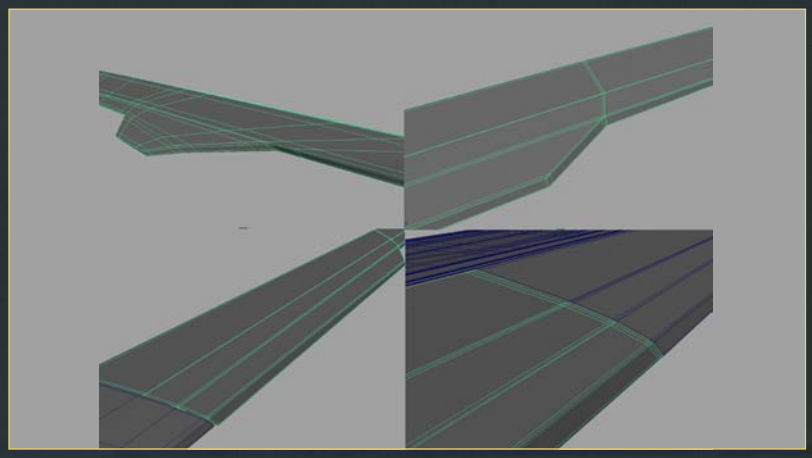


Fig 35

The side shield will be easier as you'll just have to add some more loops (**Fig.35**).

The lower hull and its interior will now be quite simple to detail. Insert four loops and move the edges, as in **Fig.36**. Then add the loops to detail the corners as previously explained for the upper hull (**Fig.37**).

Fig 36

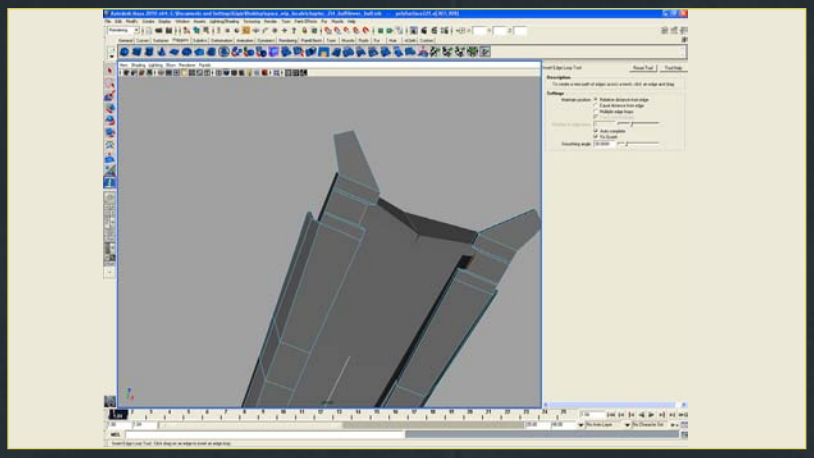
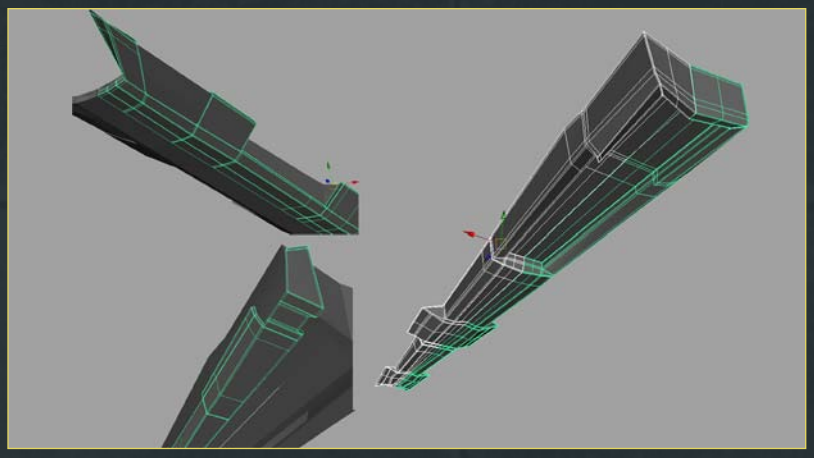


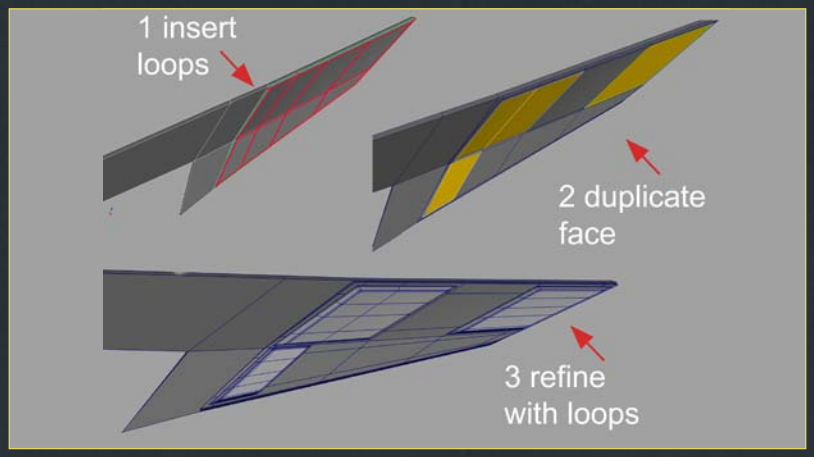
Fig 37



WINGS

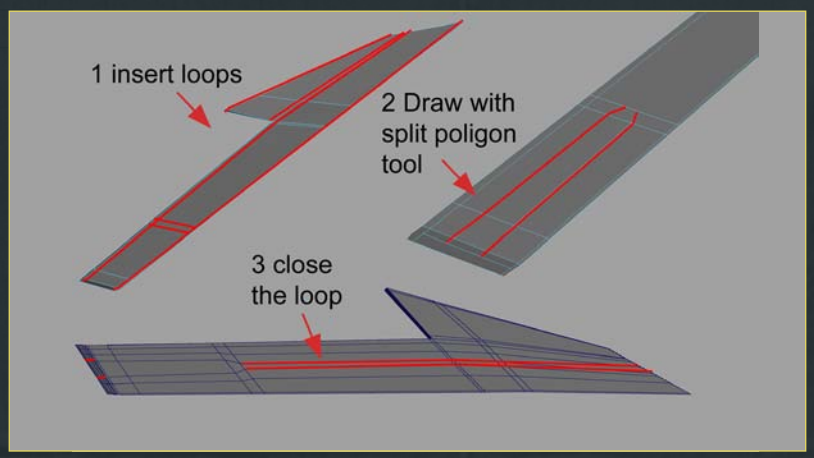
To start adding detail to the wings we'll begin with the lower part. First add a series of loops. Duplicate the new faces you've created and finally extrude and detail them (**Fig.38**).

Fig 38



For the upper part, insert the loop as in **Fig.39.** Draw the main part of the center panels with the Split Polygon tool, and finally close the loops.

Fig 39



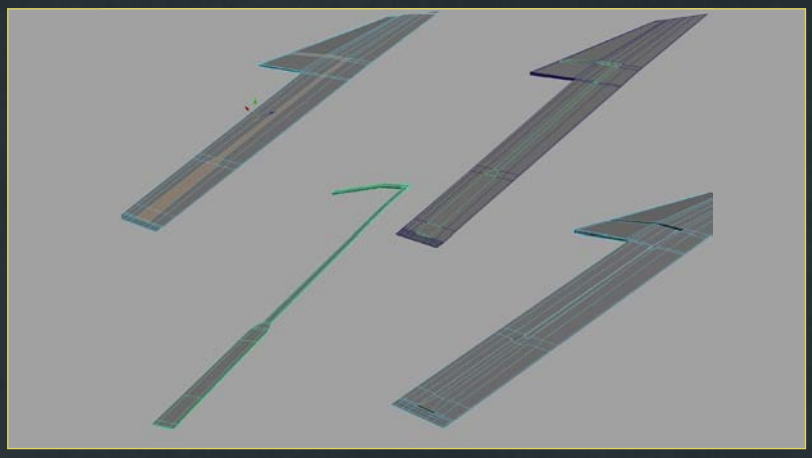


Fig 40

Now select the faces, as in **Fig.40**, and extract them. Then refine the two parts created by extruding their respective border edges.

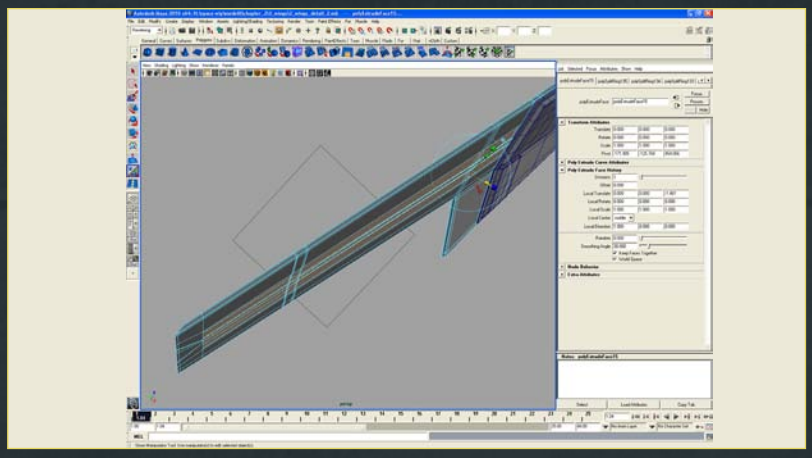
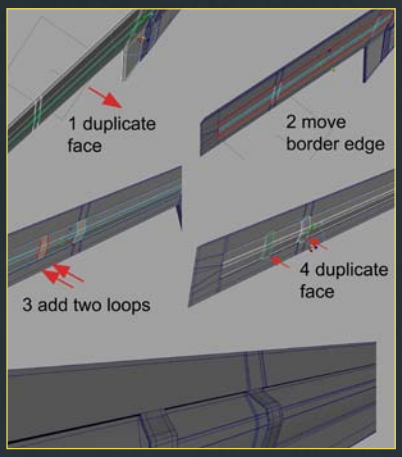


Fig 41

The lower part of the wing will require some more detailing. First select the faces as shown in **Fig.41** and extrude them inwards.



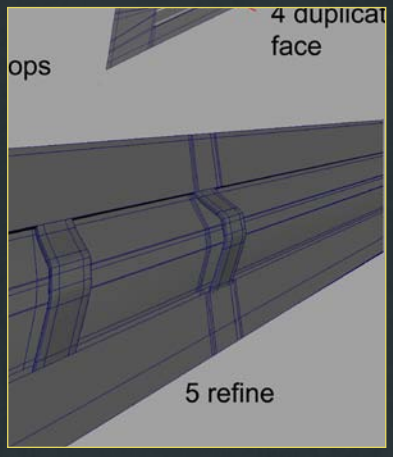


Fig 42

Next duplicate the faces you extruded and select the border edge of the faces that you've created and move them in upwards. Finally add two loops and with Duplicate Face, extract the two bridges (**Fig.42**).

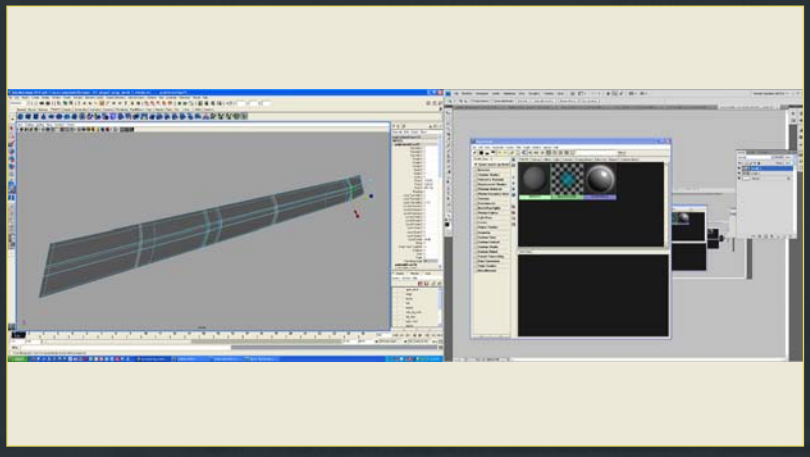
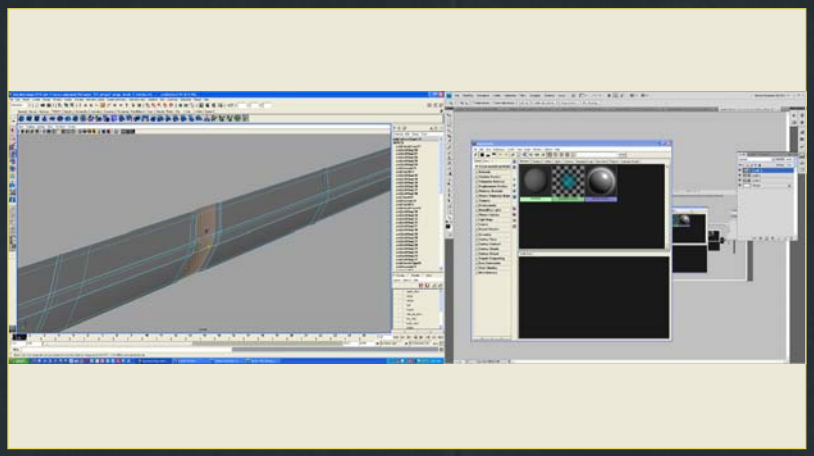


Fig 43

Now we can add some extra detail to this part. First, isolate the interior of the wing by selecting it and clicking on Display > Hide Unselected. Add some more loops, select the new faces that you've created and extrude them (**Fig.43**).

Then select the other series of faces and move them upwards (**Fig.44**).

Fig 44



Create a rectangle and align it to the wing. Extrude it twice and add some loops (**Fig.45**), then duplicate it (**Fig.46**).

Fig 45

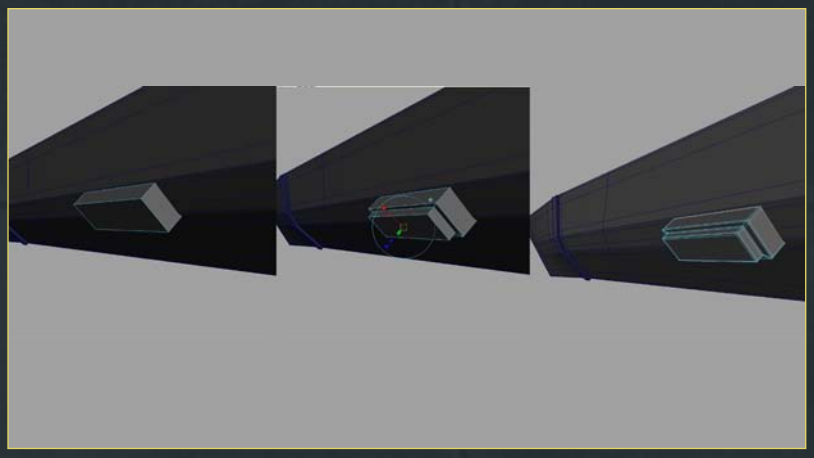
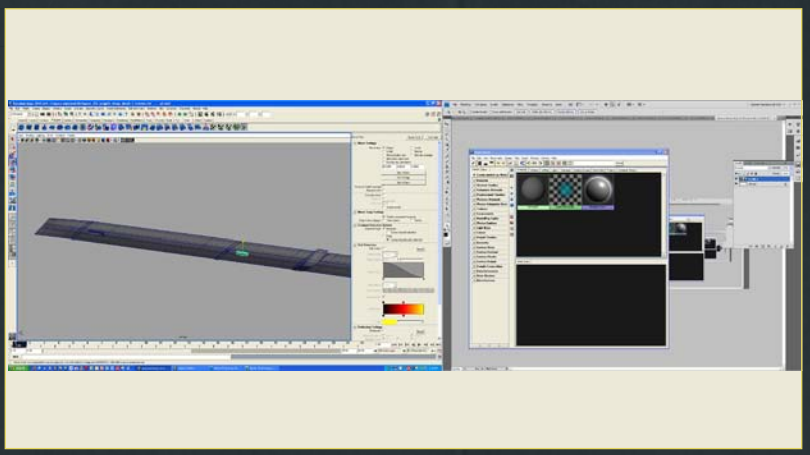
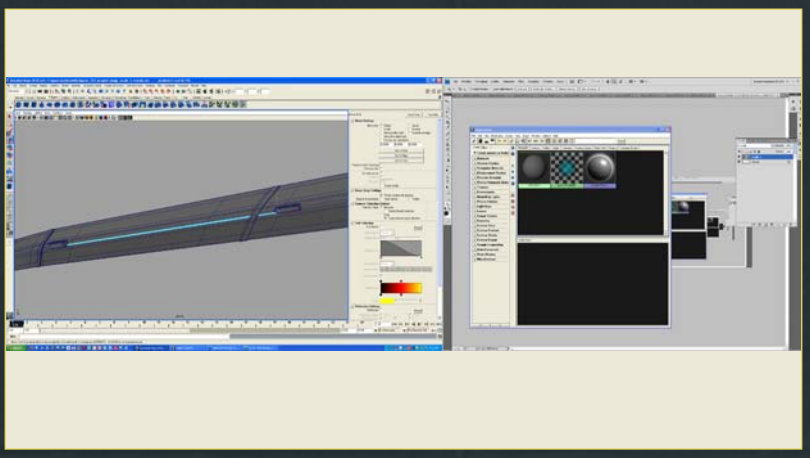


Fig 46



Create a cylinder, align it to the wing and extrude it (**Fig.47**).

Fig 47



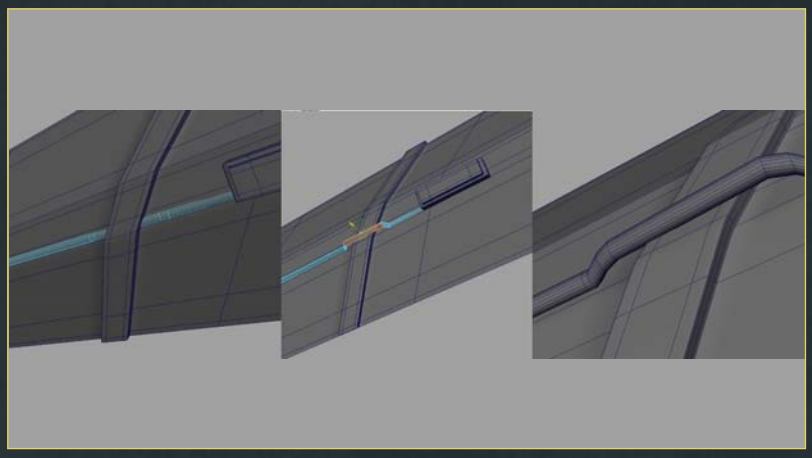


Fig 48

Now refine it in order to make it look like it crosses the panel details (**Fig.48**).

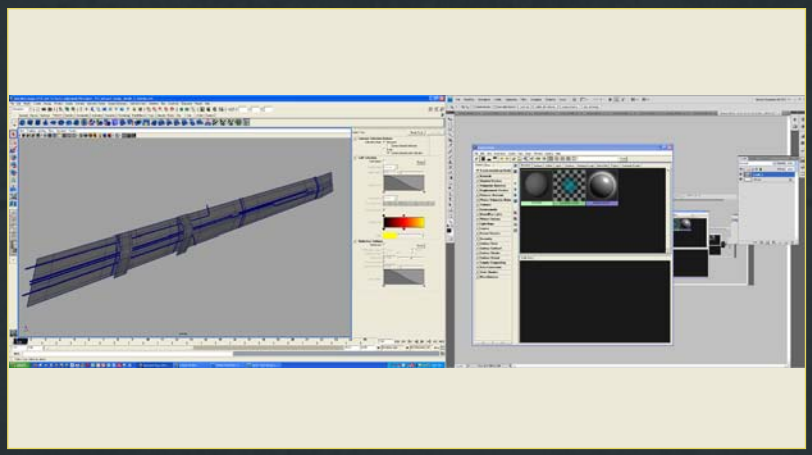


Fig 49

Duplicate the cylinder and create and modify new ones with the same technique we have mentioned before until you find a result that satisfies you (**Fig.49**).

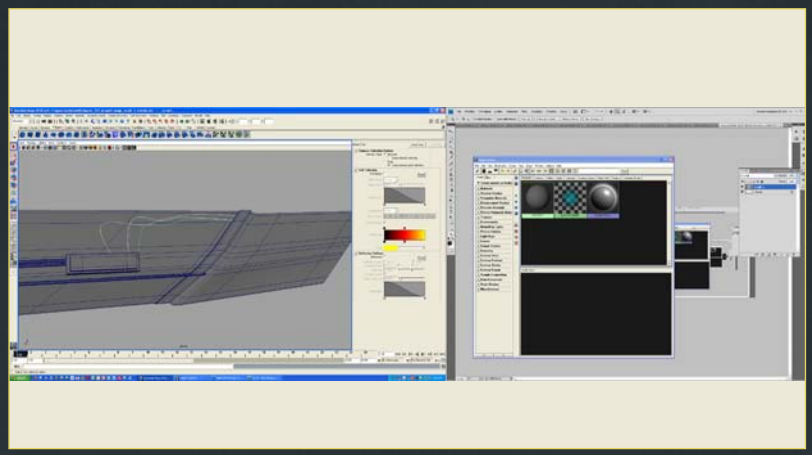


Fig 50

To add some more cables, you can draw three CV curves near one of the boxes you've created by clicking on Create > CV Curve tool (**Fig.50**).

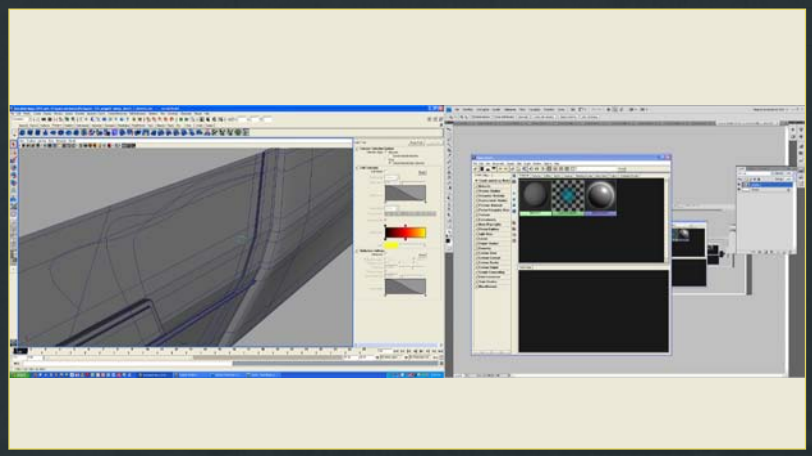
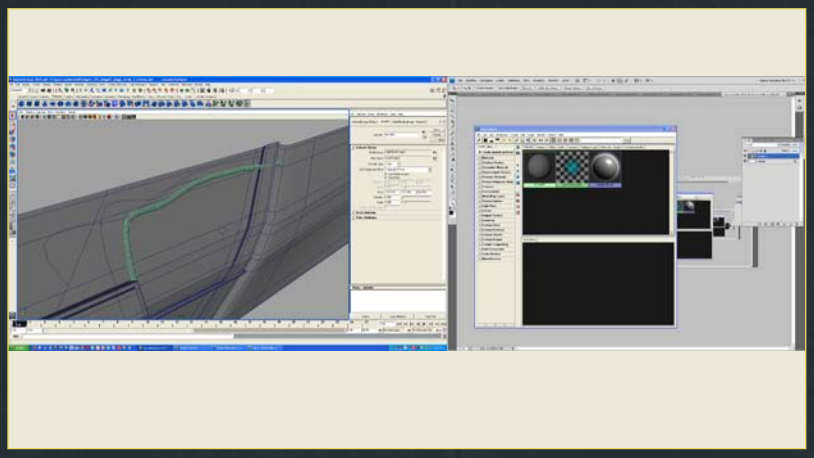


Fig 51

Then create a NURBS circle and align it to the CV curves (they have to be as perpendicular as possible) (Create > NURBS Primitives Circle) (**Fig.51**).

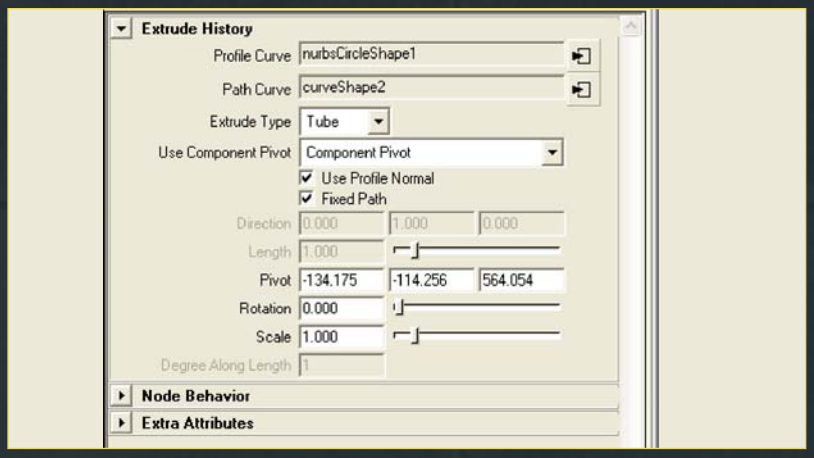
Now select the circle and SHIFT + select the first CV curve and click on Surfaces > Extrude (**Fig.52**).

Fig 52



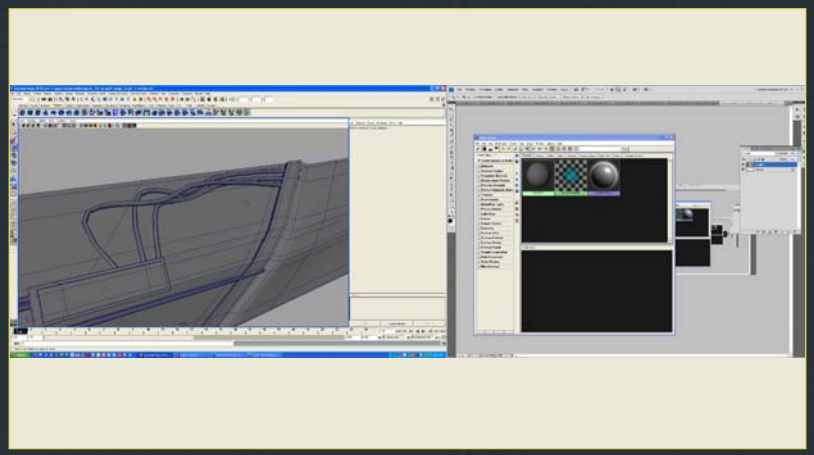
The extrude settings are shown in **Fig.53**.

Fig 53



Repeat the extrude routine for all the CV curves (**Fig.54**).

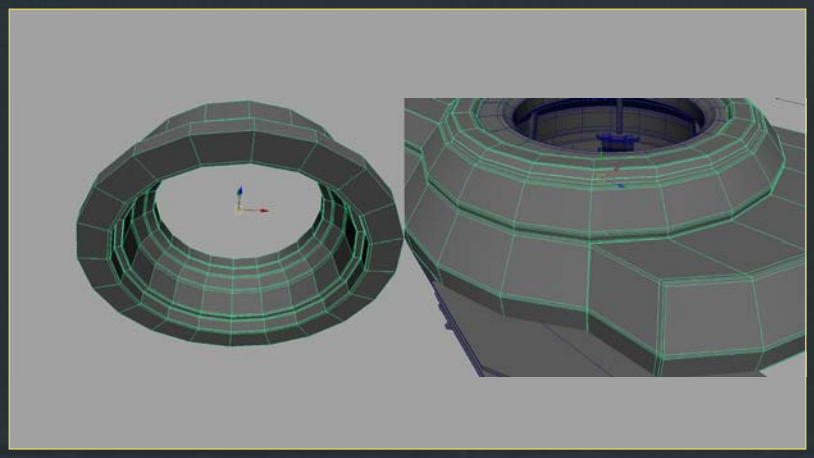
Fig 54



THE ENGINE

To detail the engine, start by adding some loops to the main parts (**Fig.55**).

Fig 55



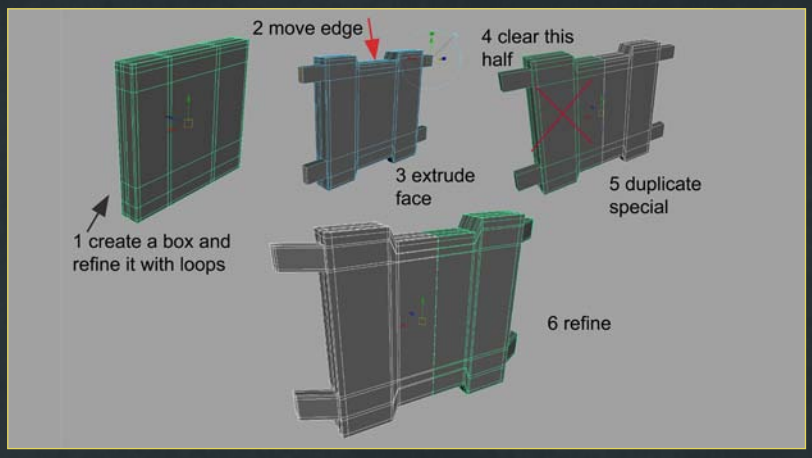


Fig 56

Next detail the engine interior, as in **Fig.56**.

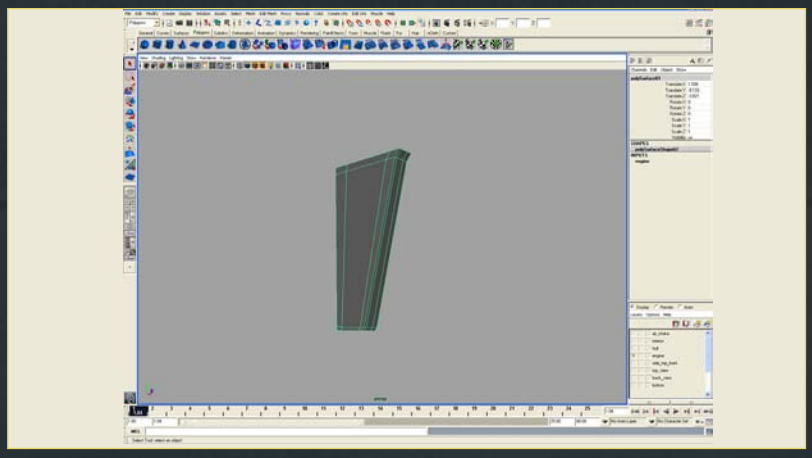


Fig 57

Next model a support and align these two elements (**Fig.57**).

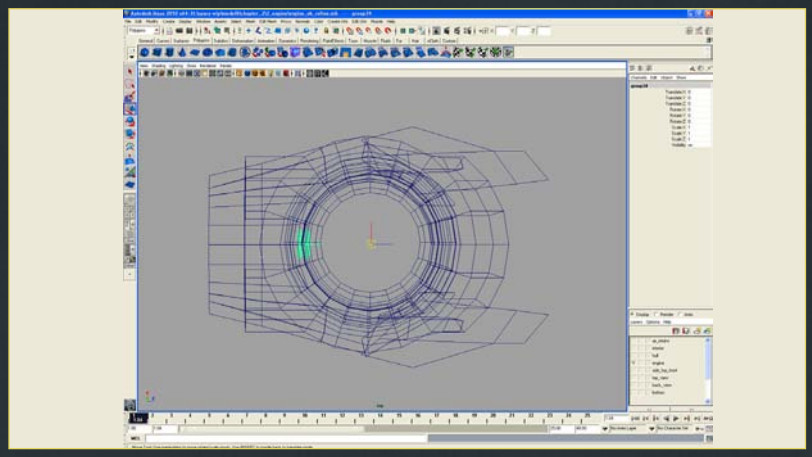


Fig 58

Then group them and then move the pivot (key D) as in **Fig.58**.

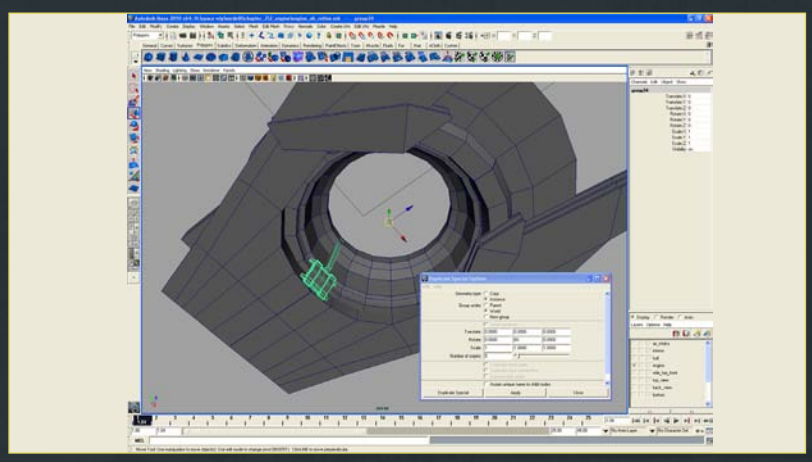
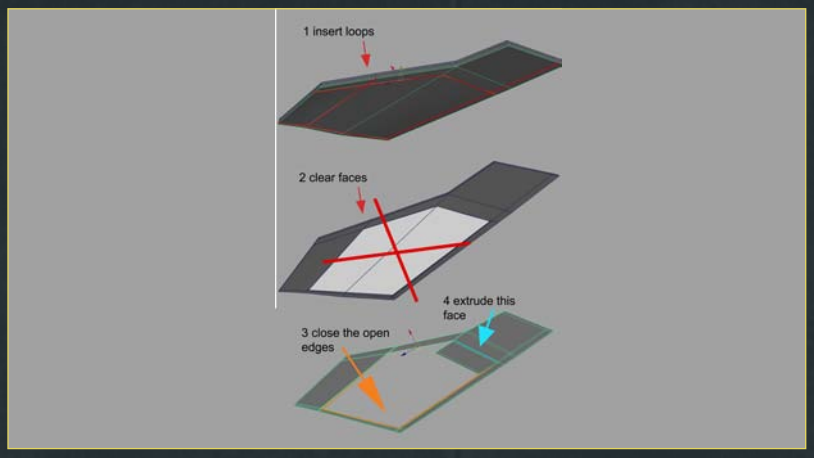


Fig 59

Select Duplicate Special with the settings shown in **Fig.59**.

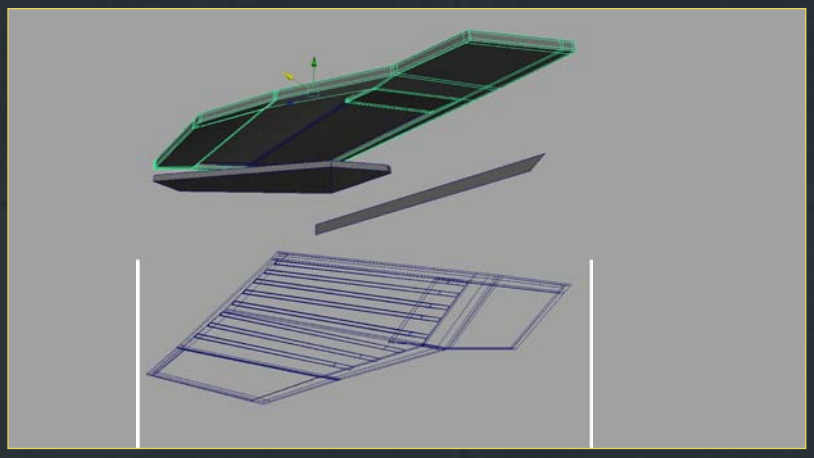
To detail the engine's terminals (**Fig.60**), duplicate the lower blade and add a series of four loops. Then delete the faces that you've created and close the open edges. Next refine the corners with more edge loops and create the center slide by extruding the faces three times.

Fig 60



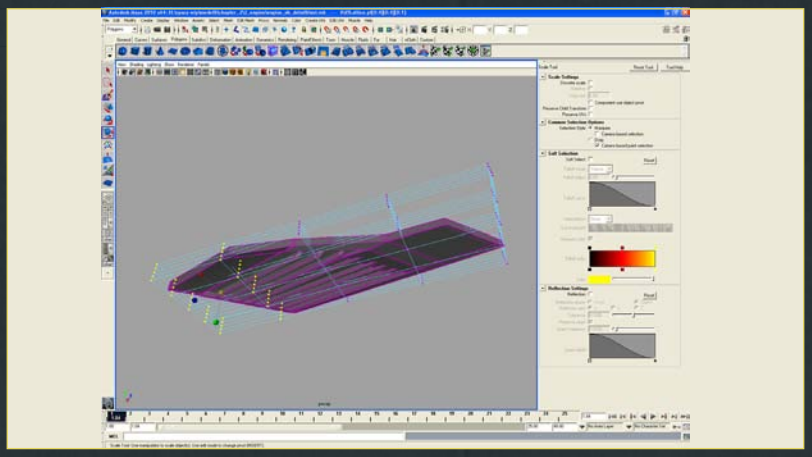
The lower blade needs to be completed by a rectangle that will have to be extruded and duplicated, as in **Fig.61**.

Fig 61



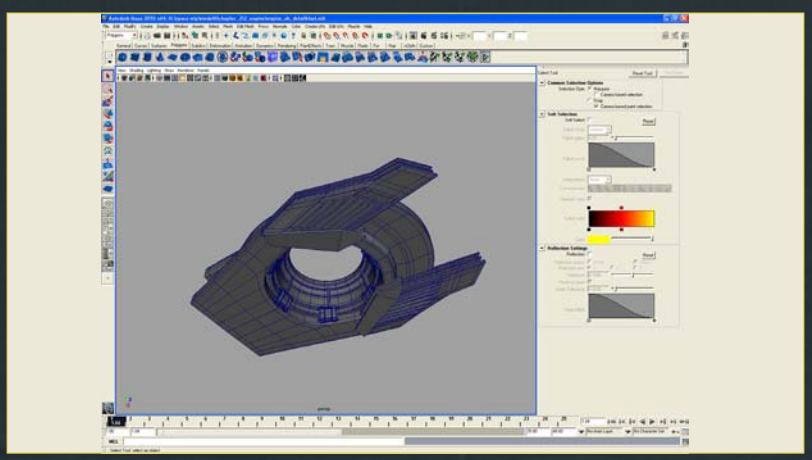
Adjust the shape with a lattice to better fit the concept (**Fig.62**).

Fig 62



Your final step should look like this **Fig.63**.

Fig 63



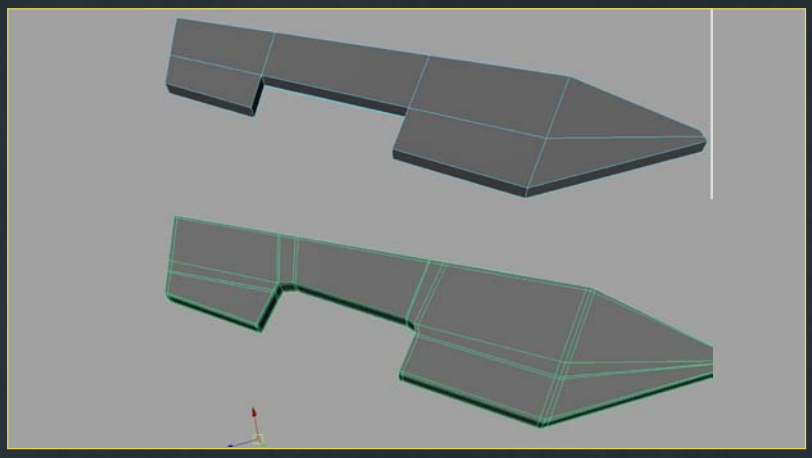
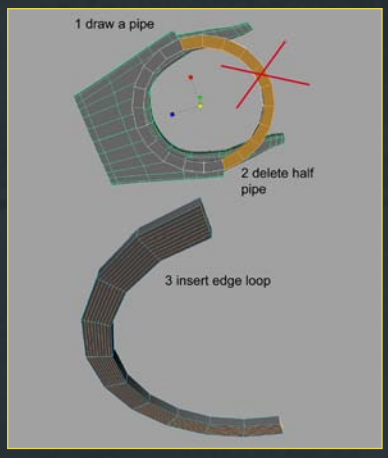


Fig 64

Now detail the engine's shields by adding loops (**Fig.64**).



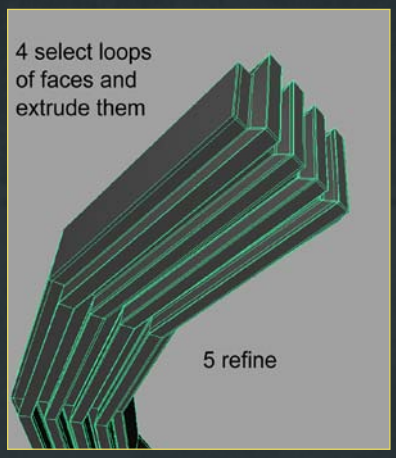


Fig 65

To close the lower engine's ring, draw a pipe (**Fig.65**).

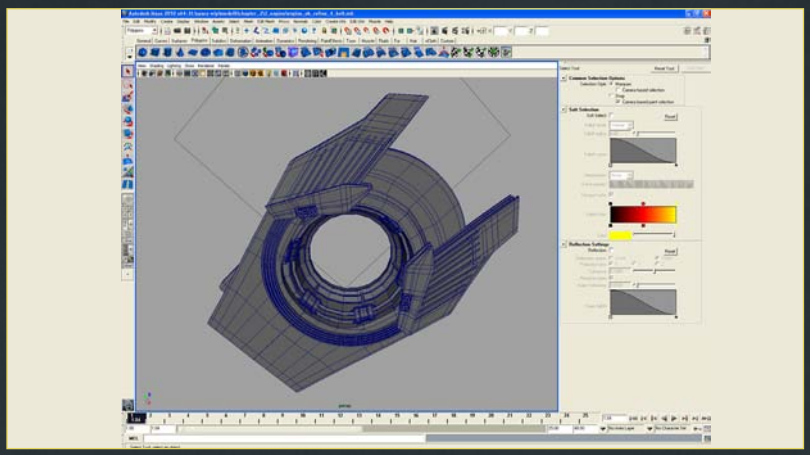


Fig 66

Delete half of the pipe and fill the hole. Then choose Insert Edge Loop, but set the Multiple Edge option to 8. Select the loops of alternate faces and extrude and refine them with the edge loops set to Relative Distance from Edge .Your final result should look like **Fig.66**.

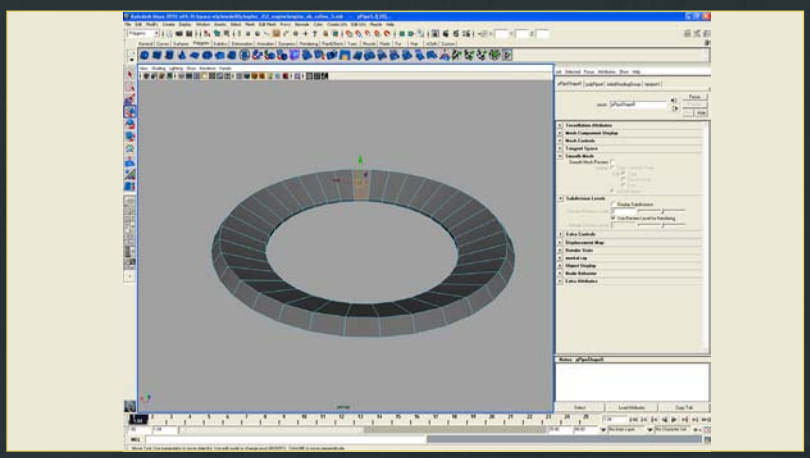
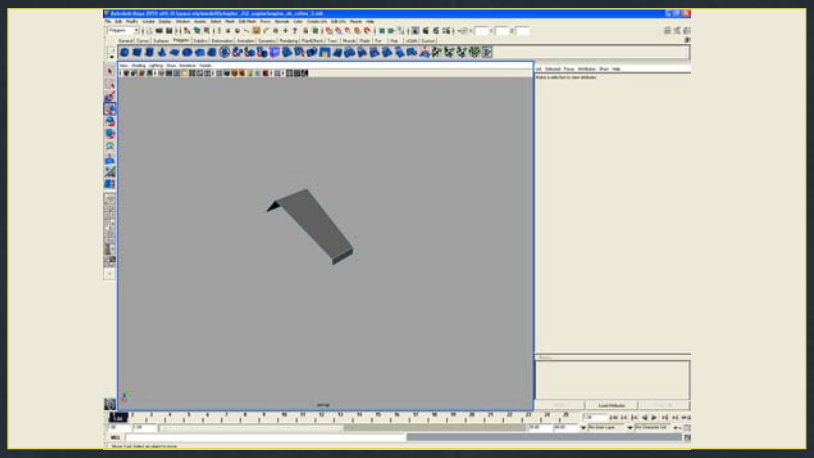


Fig 67

To create the upper ring, draw another pipe near the engine's top and scale the inner rings of vertices to give them shape like in **Fig.67**.

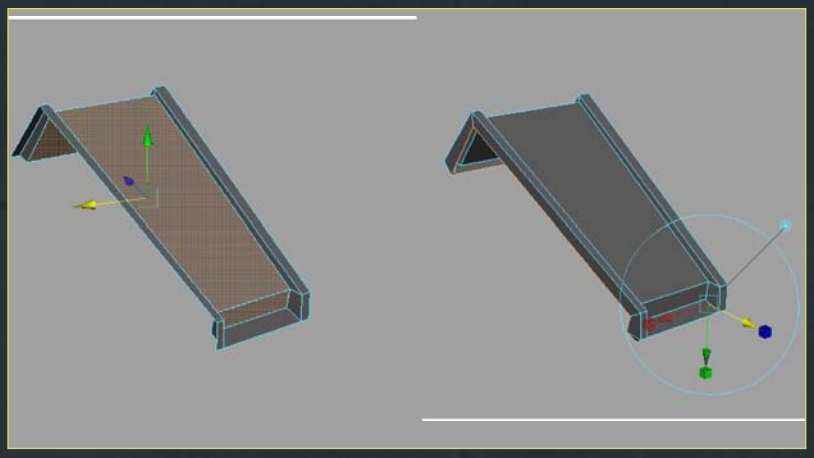
Now select one vertical loop, extract it and delete the rest of the pipe (**Fig.68**).

Fig 68



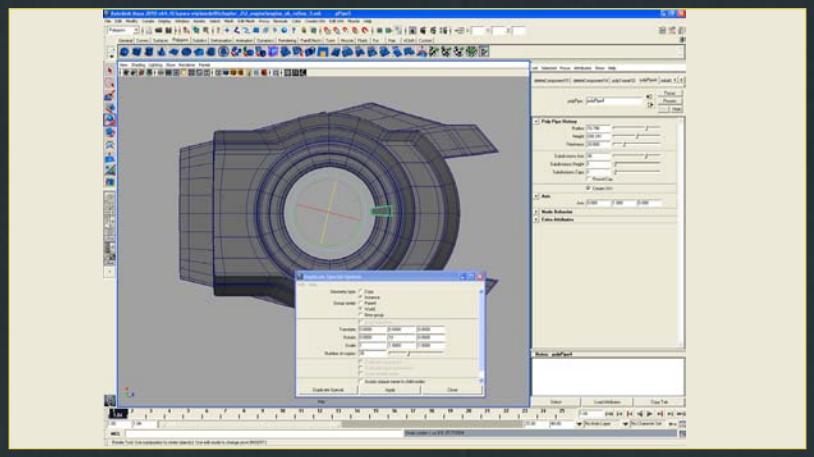
Add loops and extrude it in order to give it a shape similar to what's shown in **Fig.69**.

Fig 69



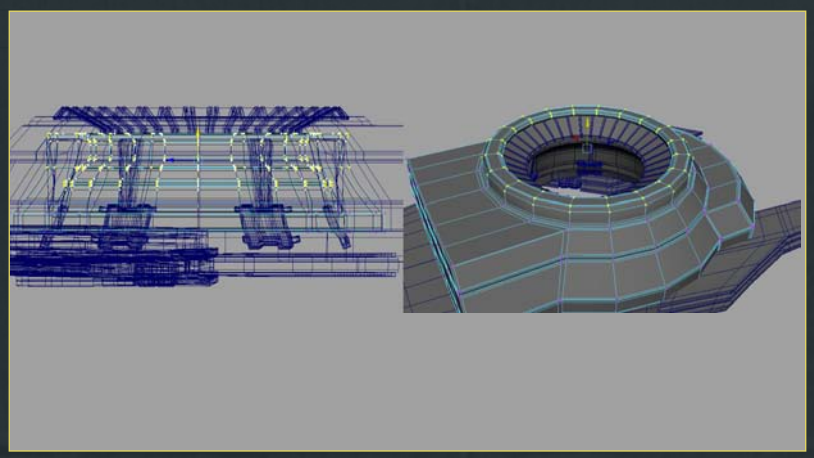
Now select Duplicate Special and set the options as follows (**Fig.70**)

Fig 70



Finally refine the inside part of the engine to fit the new shape (**Fig.71**).

Fig 71



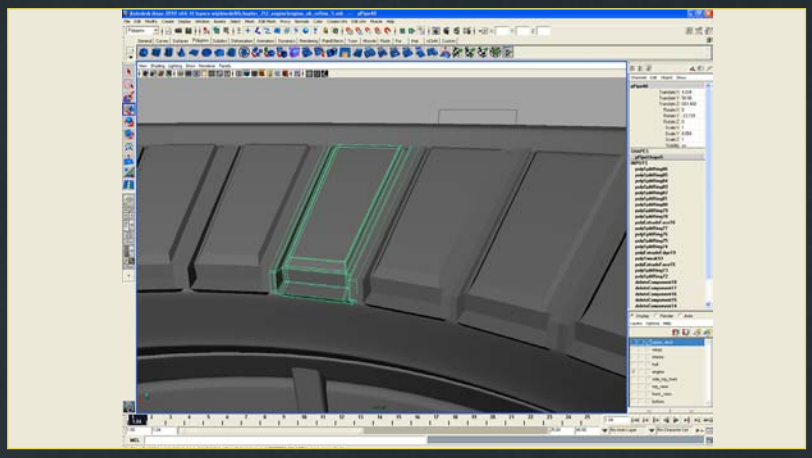


Fig 72

Notice that if you want to add some more detail to the ring you can do it by modifying one of the edges, and the others will be modified as a consequence of the Duplicate Special option (**Fig.72**).

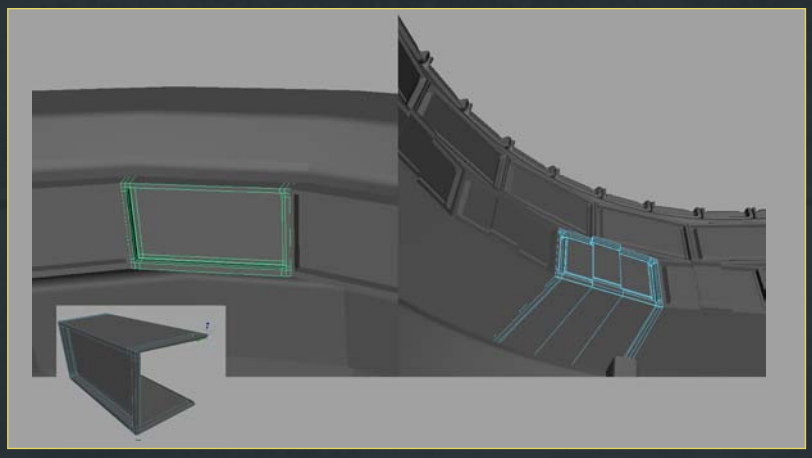


Fig 73

With the same technique, create two more rings (**Fig.73**).

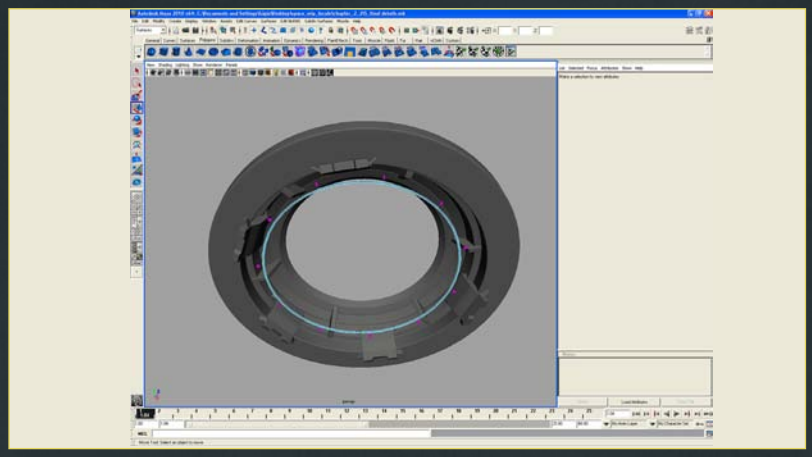


Fig 74

One last detail to add to this part of the engine is the tubes that must be modeled by modifying some NURBS primitives. Create a NURBS tour (Create > Nurbs Primitives > Tours) and position it as shown in **Fig.74**.

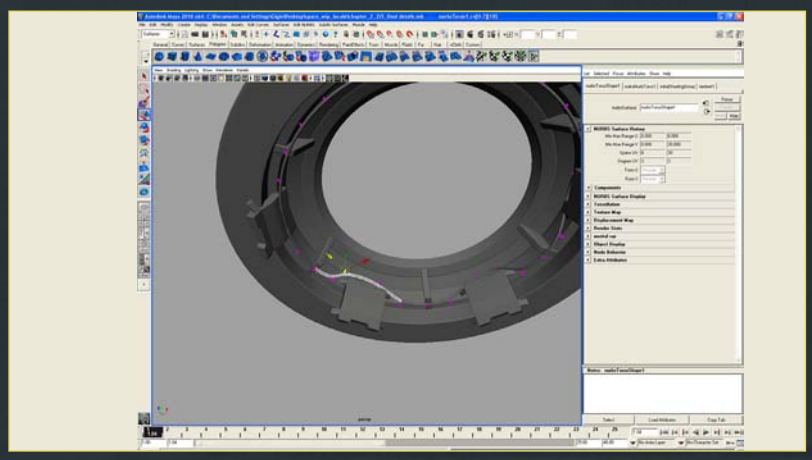


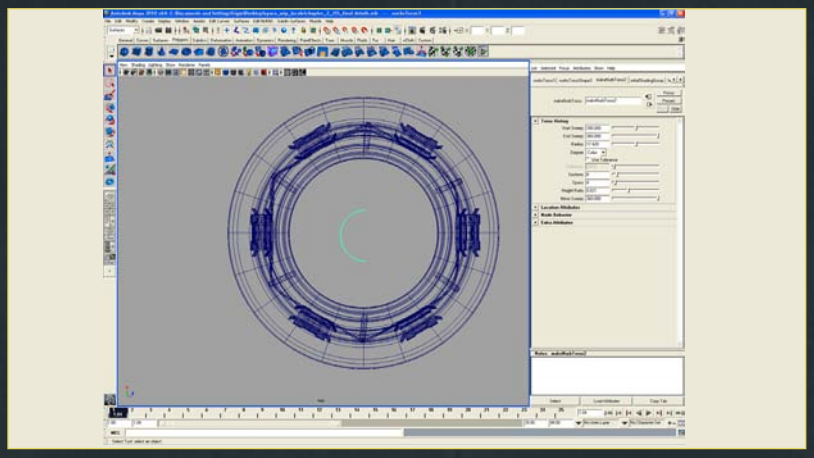
Fig 75

To change its dimensions, use the options in the Options palette. Height ratio makes it thicker or tighter. The number of sections will make it seem more or less smooth. Do not increase this too much because more sections will increase the number of control vertices and it may become difficult to manipulate.

Once you've created a tour that fits your needs, start moving the control vertices (right click > Control Vertex) and modify your tour until you get the sinusoidal shape of the tubes from the concept (**Fig.75**).

In the same way, create a smaller tour with End Sweep set to 180 (**Fig.76**).

Fig 76



Modify and duplicate it in the same way as you modified the other tours (with control vertices). Once you're satisfied you can rebuild the surface and add more detail to it by clicking Edit Nurbs > Rebuild Surfaces (**Fig.77**). Once you're done, Duplicate Special this group of tours with the same settings of the plates that you previously modeled (see Fig.70).

Fig 77

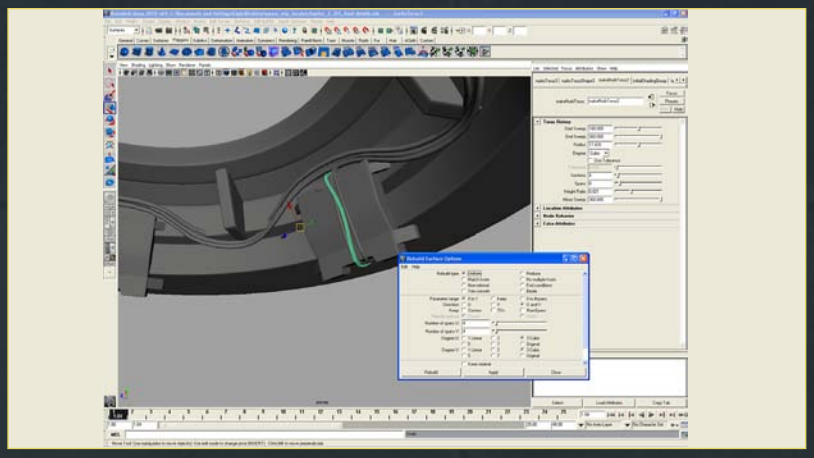
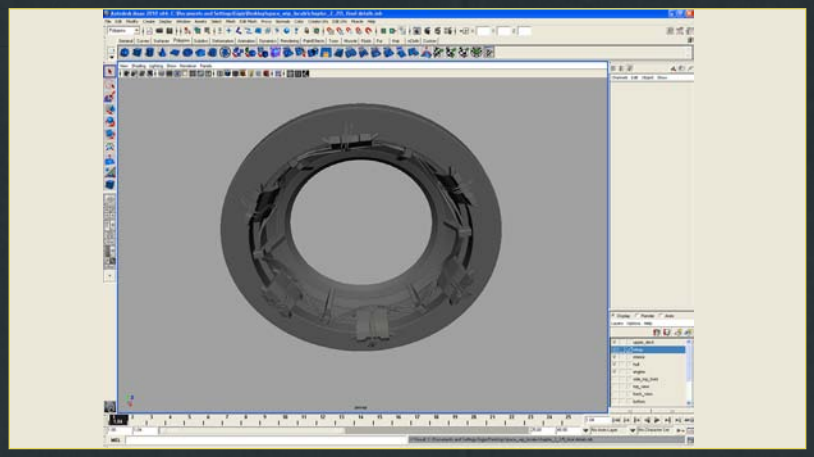


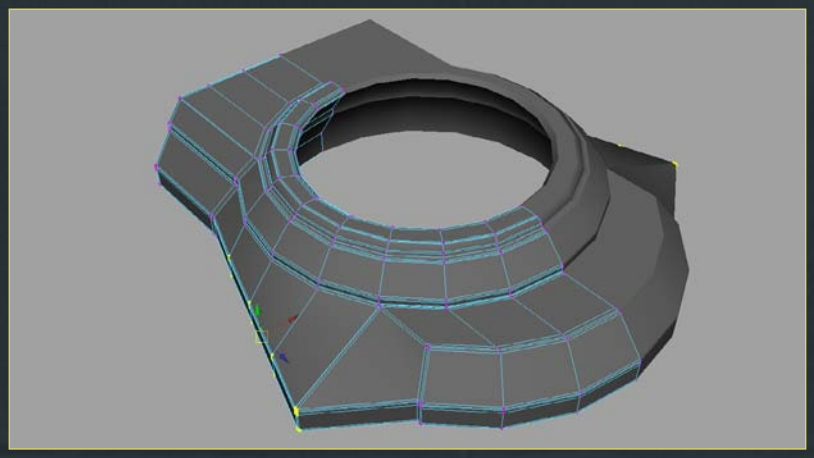
Fig.78 shows the final result.

Fig 78



The external part of the engine will need a tune up too. First take just one half and Duplicate Special it. Then modify the hull's shape by moving its vertices, as in **Fig.79**.

Fig 79



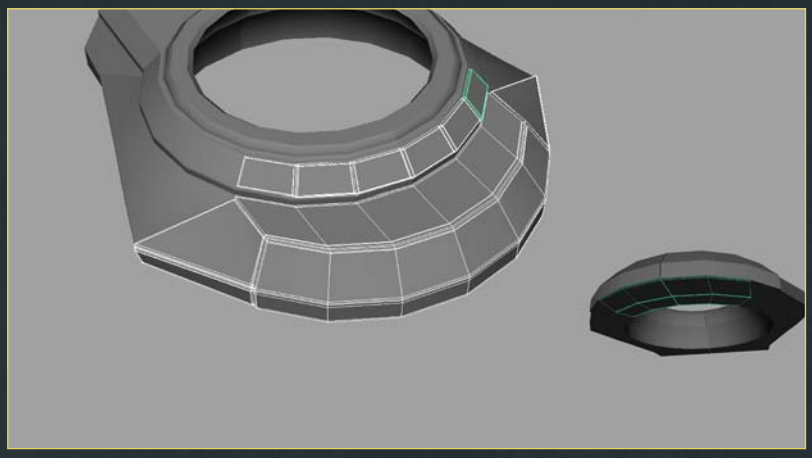


Fig 80

Next, duplicate the faces indicated in **Fig.80** to create some independent panels (this will help you to UV map this part and will give more detail to this section).

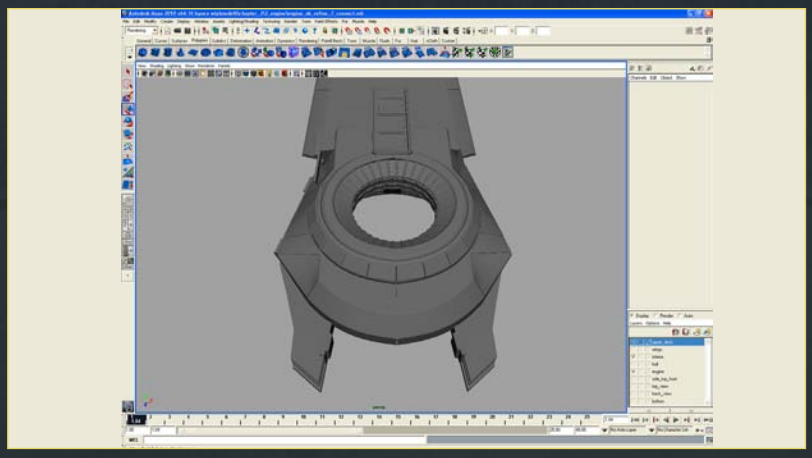


Fig 81

Fig.81 shows you the final result.

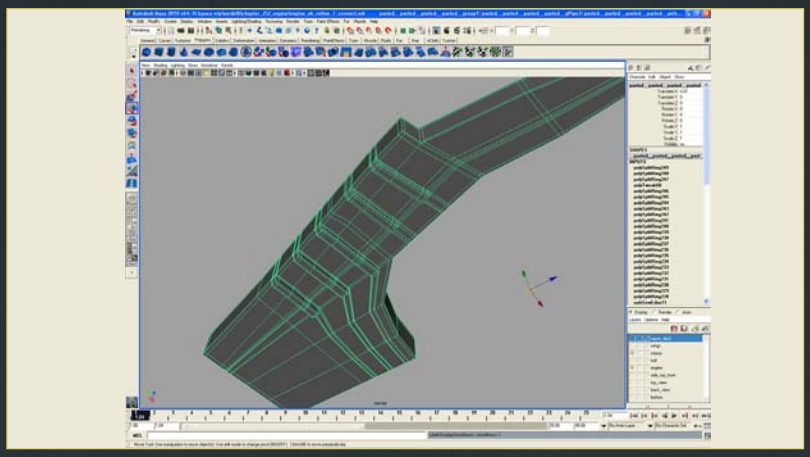


Fig 82

For the lower part, add a series of loops and extrude the new faces as in **Fig.82**.

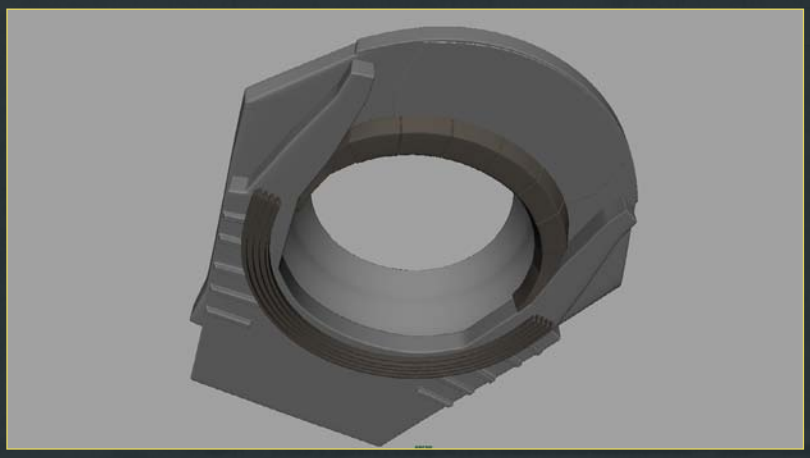
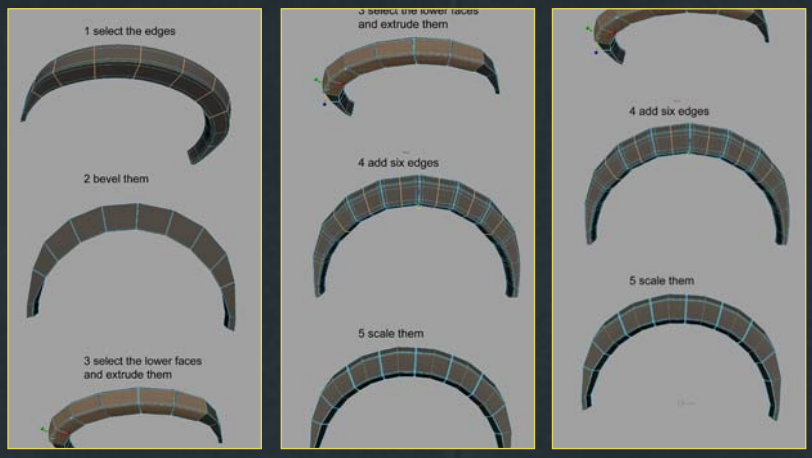


Fig 83

There is still a series of tiny details that can be added to complete the engine's details. They are approximated forms in the concept, but they can help to give a more realistic look to the ship. First we can add some more detail to the engine's lower ring (**Fig.83**) by selecting the vertical edge loops and giving them a Bevel.

Select the face loops between the beveled edges and extrude and refine them with edge loops (**Fig.84**).

Fig 84



Blade supports next (**Fig.85 – 86**).

Fig 85

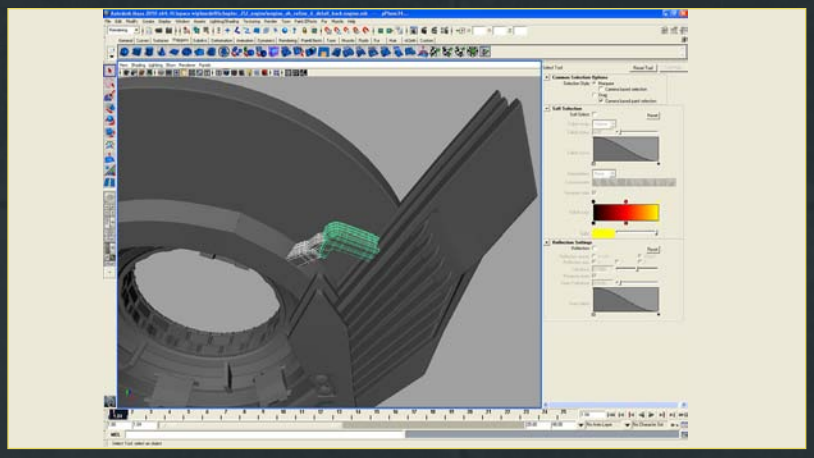
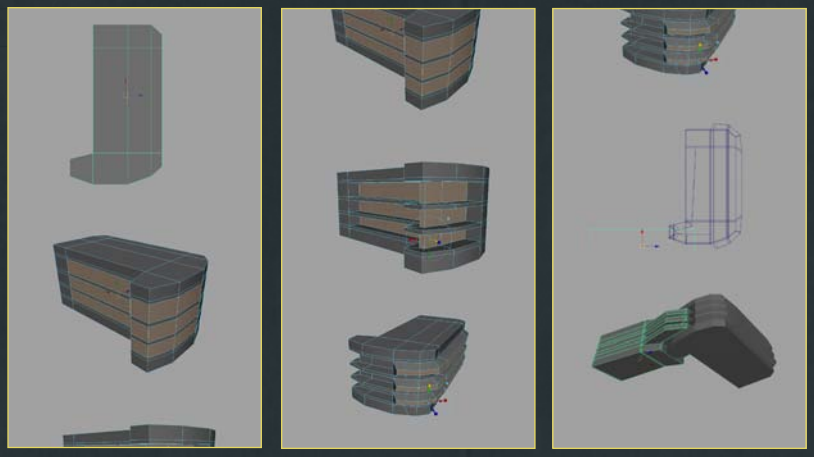
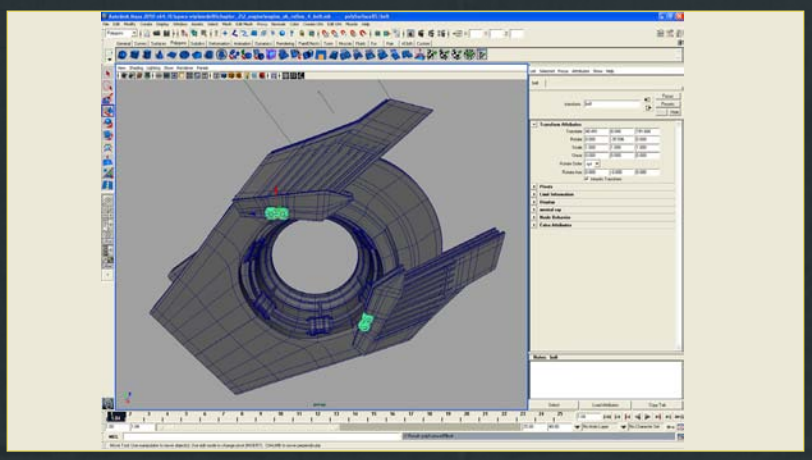


Fig 86



The bolts on the blade's hull (**Fig.87 – 88**).

Fig 87



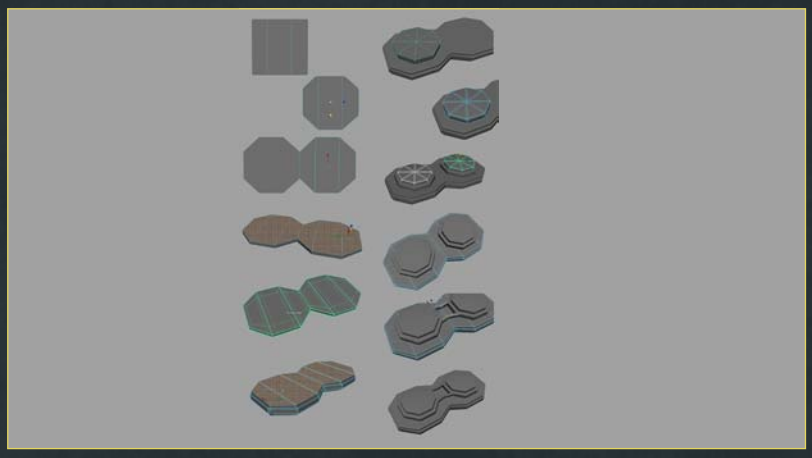


Fig 88

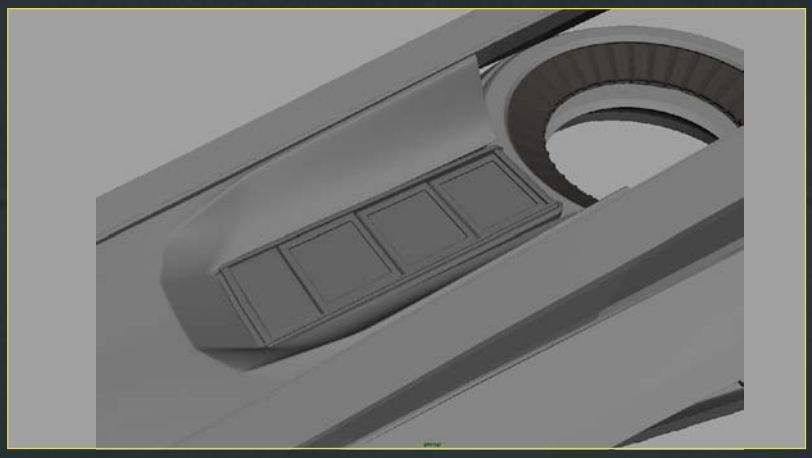
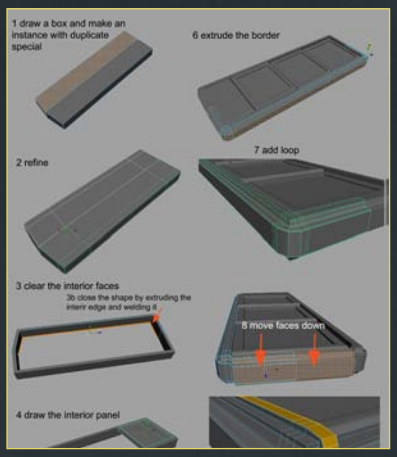


Fig 89

Between the deck and the engine we have to add the chrome panels (**Fig.89 – 90**).



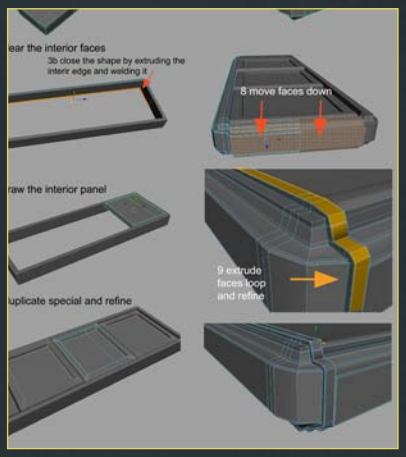


Fig 90

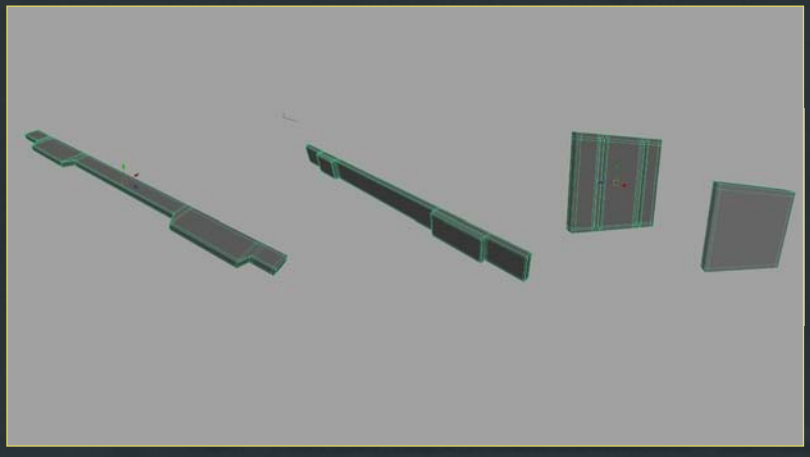


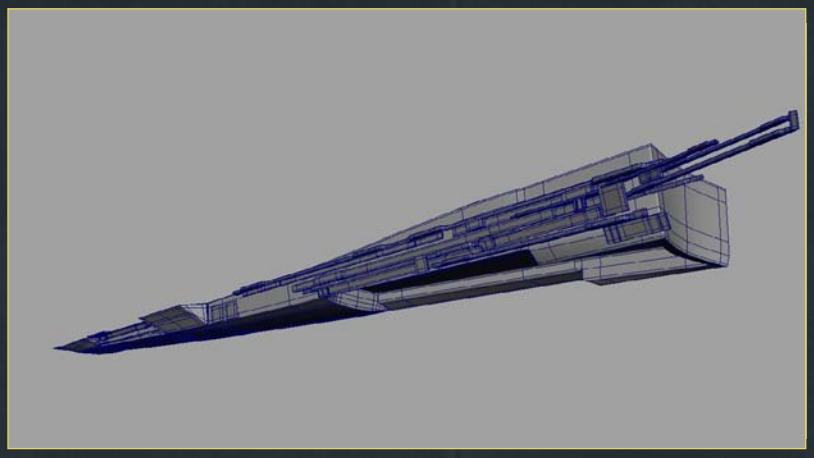
Fig 91

THE INTERIOR

The interior needs a series of elements that fill the part between the two main hulls. To do this and follow the concept, create three base shapes (**Fig.91**).

Duplicate and scale it until you create a structure that is complicated enough (**Fig.92**).

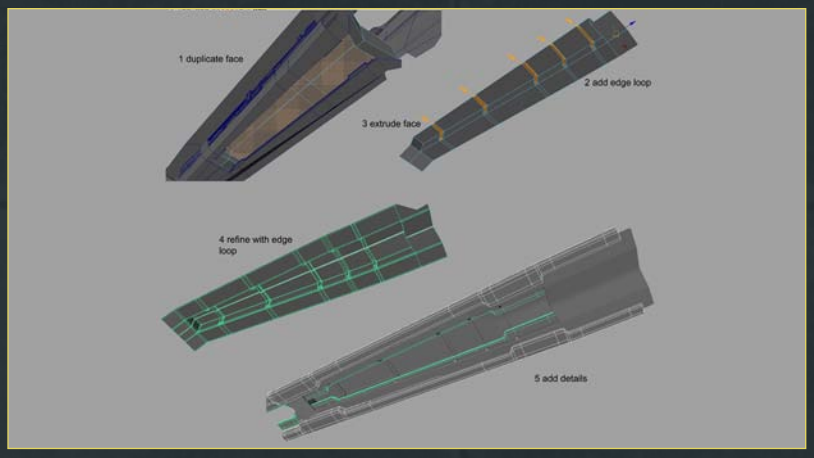
Fig 92



TIP: Since all these elements will have to be UV mapped, it would be a good idea to Duplicate Special most parts of the elements. Duplicate Special affects the UV map and will also save you a bit of time.

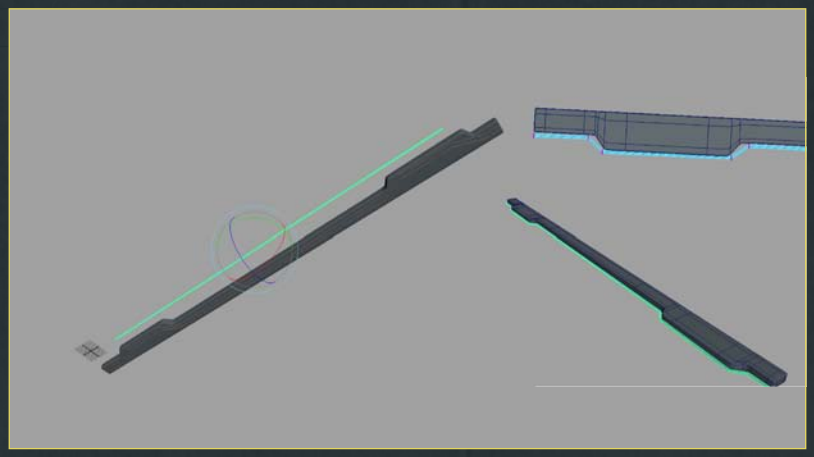
Another part that needs more detail is the lower hole (**Fig.93**).

Fig 93



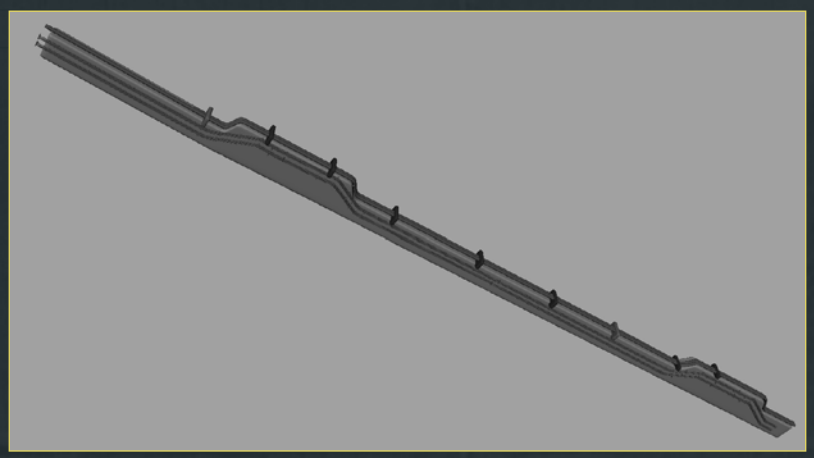
Select the internal faces and duplicate them. Next insert a series of loops and extrude the new faces to detail the corner. To refine the hole, add some of the pieces you've created before (see Fig.91). As a final touch you can add some cables with a technique similar to the one used for the lower wings detail. Highlight the first of the interior elements, draw a cylinder as long as the element and model it in order to let it fit to the shape (**Fig.94**).

Fig 94



Now duplicate the cables and model them until you obtain an object like the one shown in **Fig.95**.

Fig 95



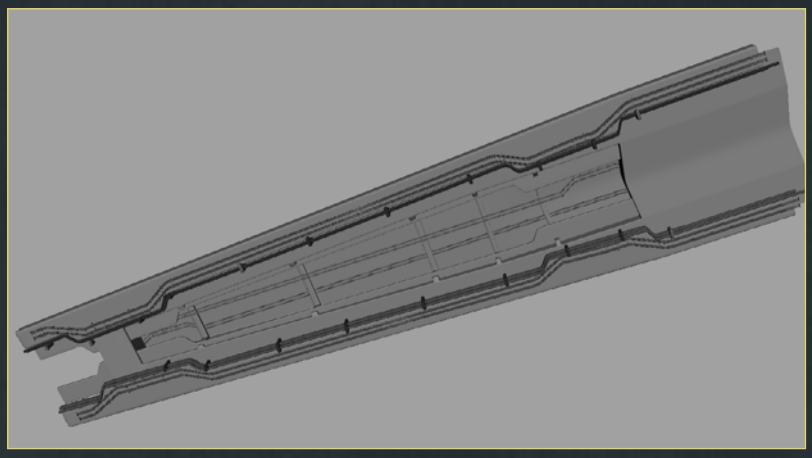


Fig 96

By duplicating your cables your final result should be something like **Fig.96**.

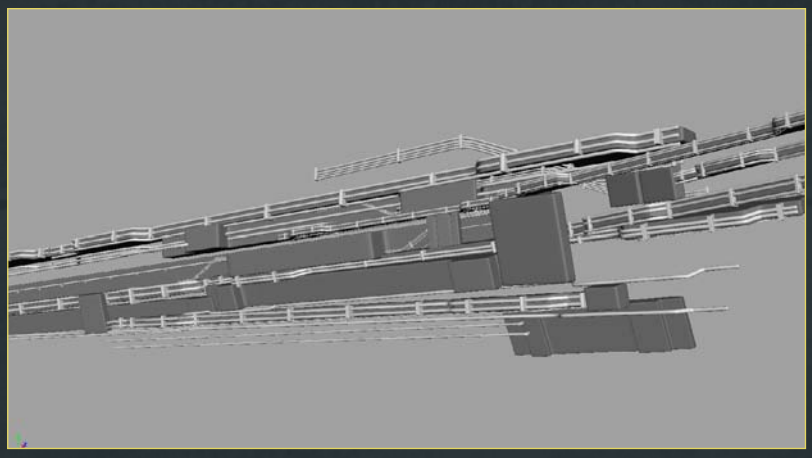


Fig 97

The same elements should be used to enhance the level of detail on the side of the interior (**Fig.97**).

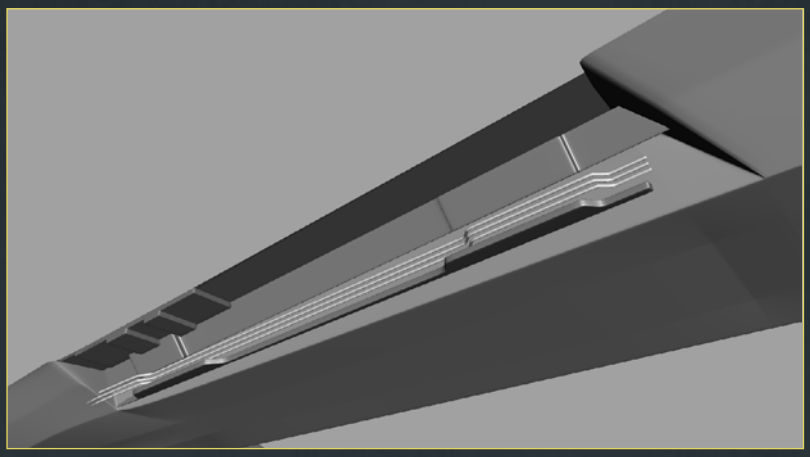


Fig 98

The front part of the interior will be detailed reusing some of the elements created before (**Fig.98**).

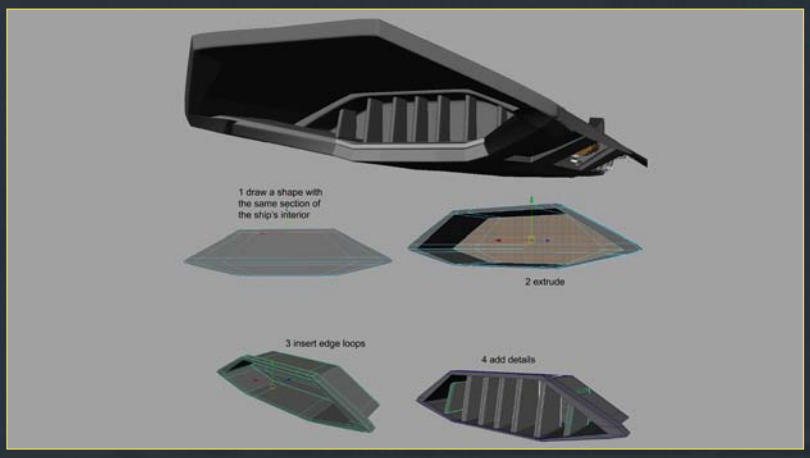
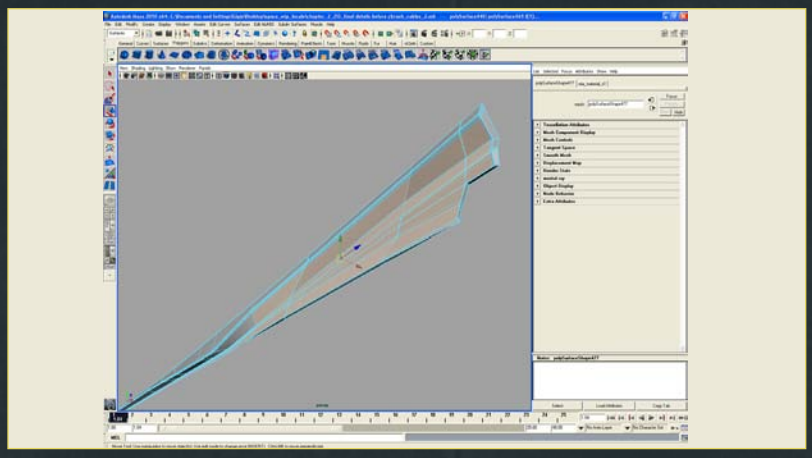


Fig 99

Next, add a cylinder like the one modeled in **Fig.99**.

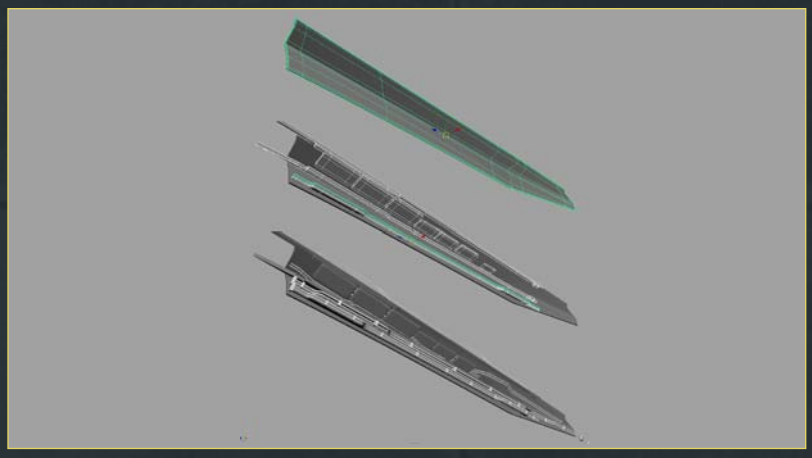
The front nose will have to be closed with a shape (**Fig.100**).

Fig 100



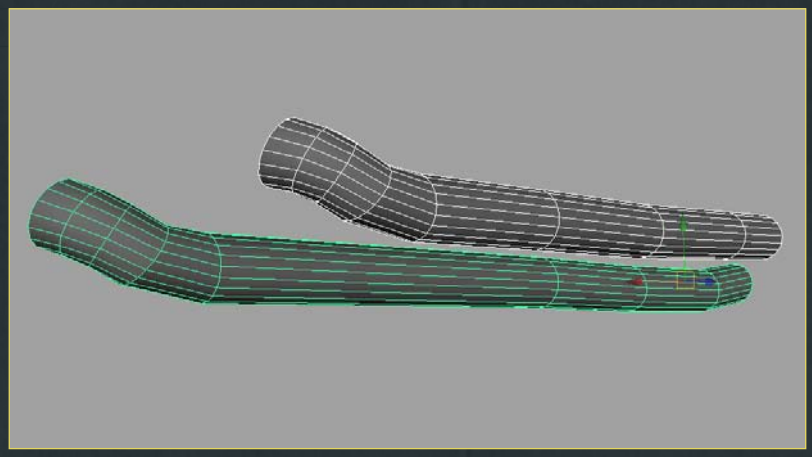
To detail the rear fins, first duplicate the faces as shown in **Fig.101**.

Fig 101



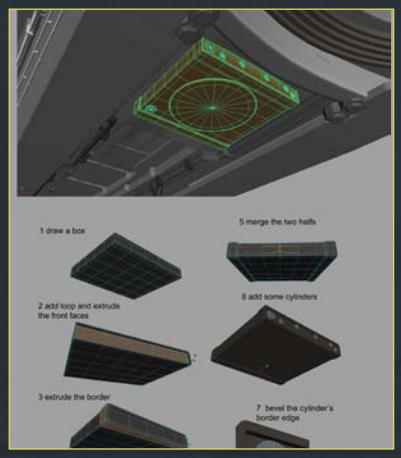
Add loops to detail the corners. Then add a series of elements like those created for the hull's interior. Finally, add the cables (**Fig.102**).

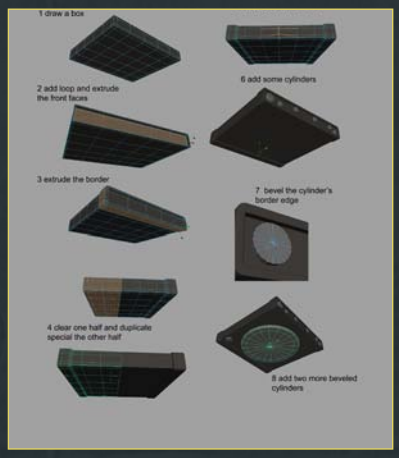
Fig 102



The last two elements to model are the two chrome tubes that stand in the middle of the hull's interior. These are two cylinders modified as shown in **Fig.103**.

Fig 103





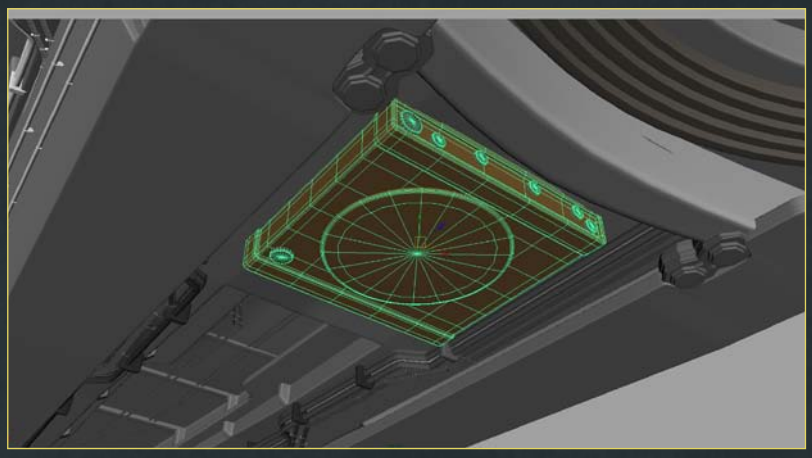
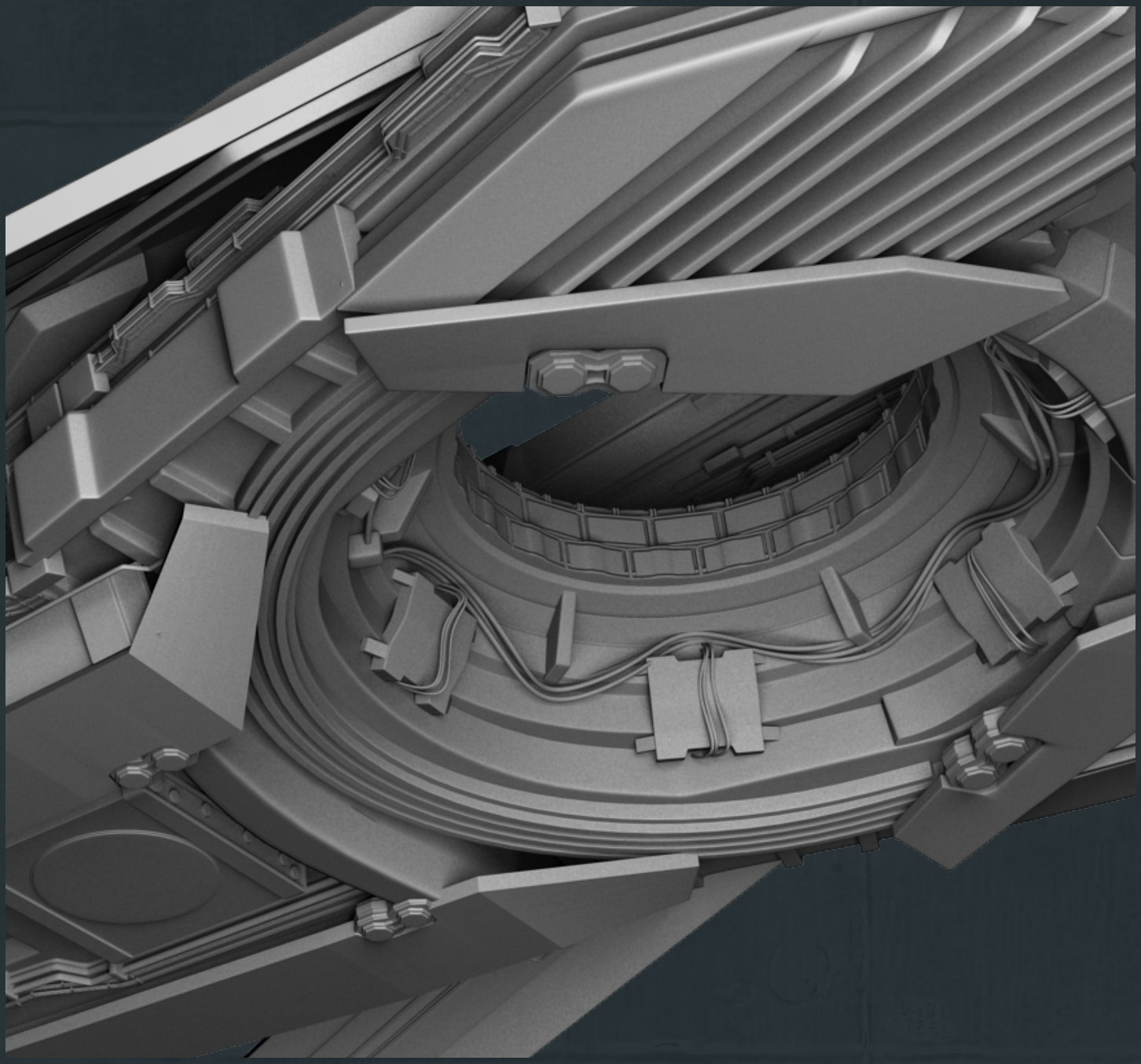
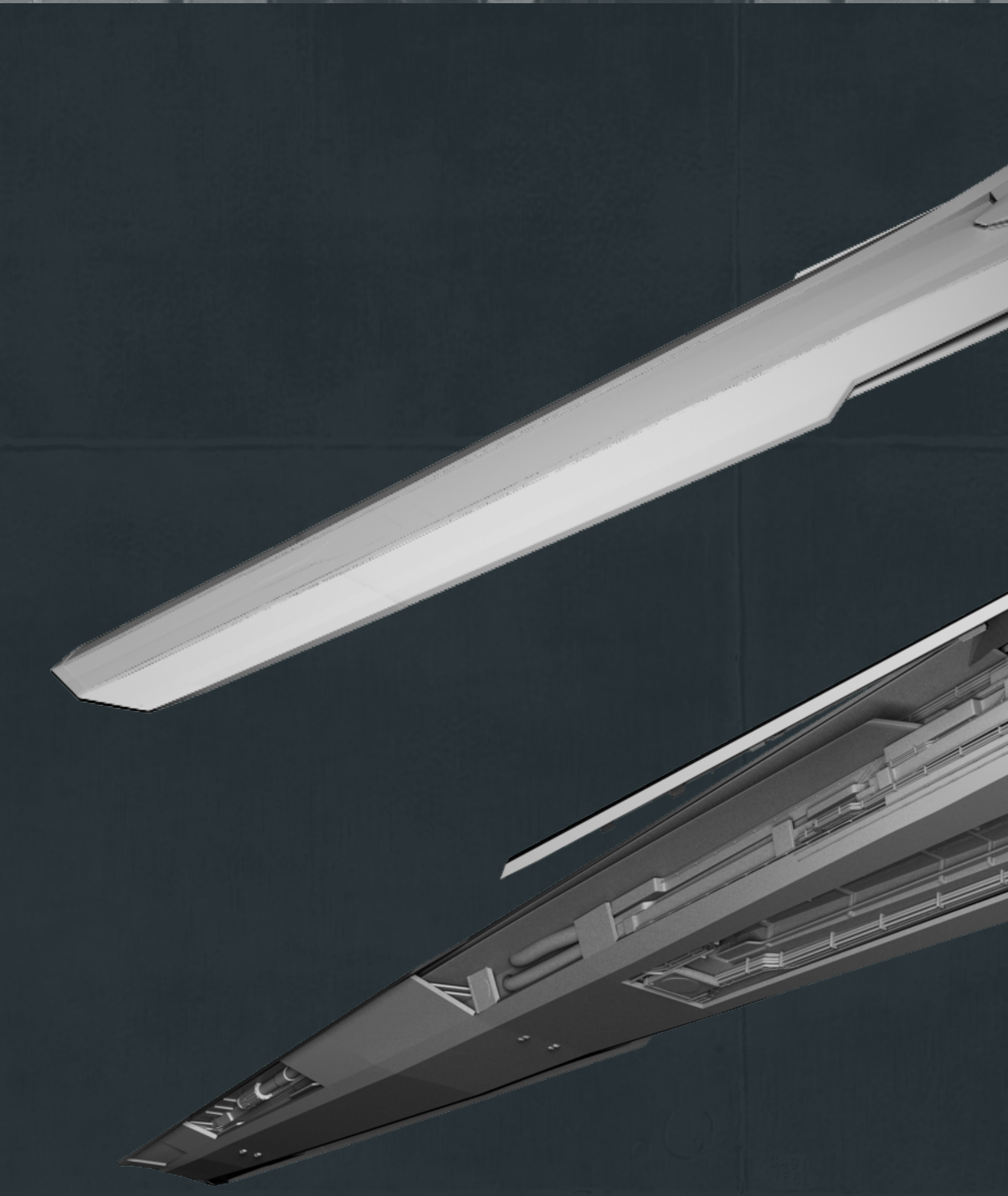


Fig 104

Finally work on the golden box in the lower hull (**Fig.104 – 105**).

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